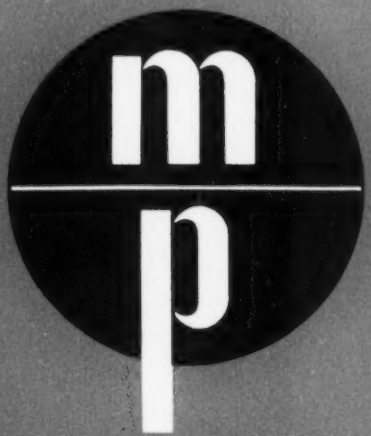
MODERN PLASTICS



JUNE 1951

It pays to use your custom molder's know-how

say makers of new portable 35mm. slide viewer



PROJECT:
Case, cover, condenser housing and lens housing for viewer.

CUSTOMER:
The FR Corporation, New York.

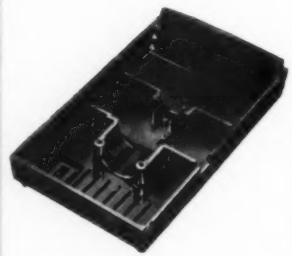
MOLDER:
Plastic Molding Corporation
Sandy Hook, Conn.

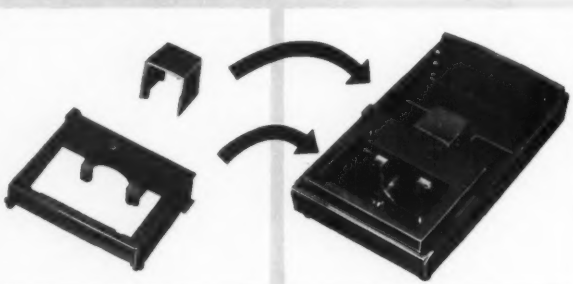
MATERIAL:
Durez black general-purpose and low-pressure phenolics.

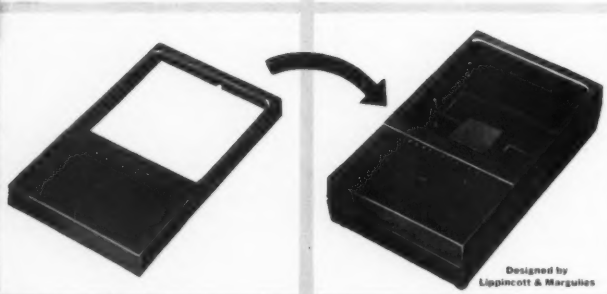
No. 27 in a Series on Plastics Skill at Work...

MOLDER USED ADAPTABILITY of Durez skillfully. Base is plunger molded low-pressure compound, which flows easily in the mold and provides high dimensional stability. One general-purpose material is used in 3 other pieces; the housings for the lens and condenser are plunger molded, and the cover is compression molded.

STRAIGHT OPEN AND SHUT dies with no cam actions or inserts are used, despite intricate shapes. Slots underneath transverse walls are obtained by locking out within the cavity itself, or by molding from 2 sides with a side lockout.







Designed by Lippincott & Margulies

Taking a new approach to the possibilities inherent in 35mm. color slide viewing, both as a hobby and a merchandising aid, The FR Corporation is now marketing a compact, inexpensive unit that utilizes the versatile properties of Durez phenolic plastics.

Named the Port-a-View, the new unit weighs a scant 4 lbs.— its largest parts are Durez. It is easily carried in the hand or on a shoulder strap. The dark TV-type reflex screen is six inches square — permits viewing by small groups in complete daylight. Automatic feed with storage for 72 slides helps make projection "as easy as showing a snapshot album."

The heat resistance, self-insulation, and easy moldability of Durez materials all lend themselves to the requirements of FR engineers and their designers. Almost no finishing is required — for Durez has a "built-in" glossy finish, lustrous and lasting.

When it comes to using or considering the use of plastics, your custom molder may save you much money and time. It is wise to call on him before your plans become "set." He knows the Durez materials especially well, can help you get the most from them in design and engineering. Our own 30 years of specialized experience in developing phenolic materials can always be utilized through our staff of competent field technicians.

Our monthly "Durez Plastics News" will keep you informed of industry's uses of Durez. Write, on office letterhead, to Durez Plastics & Chemicals, Inc., 1206 Walck Road, North Tonawanda, N. Y.

DUREZ

PHENOLIC RESINS

- MOLDING COMPOUNDS
- INDUSTRIAL RESINS
- PROTECTIVE COATING RESINS

PHENOLIC PLASTICS THAT FIT THE JOB



Catalin STYRENE

THE INJECTION MOLDER'S CHOICE FOR MASS-MARKET MERCHANDISE

CATALIN STYRENE stimulates marketing incentive! It enters *lightly* into a product's material costs and encourages the development and promotion of popularly-priced merchandise. The smartly designed, richly colorful Tilco* dressing combs, soap chests and powder jars, pictured here, are quantity-production items—mass-market attractions. They combine, in their use of CATALIN STYRENE, those factors which insure lowest manufacturing cost and highest consumer acceptance.

**Products of Tilton & Cook Co., Leominster, Mass.*

In addition to Catalin Styrene molding compounds and Catalin Cast Phenolics, the Catalin plastics and resins family includes . . . **Laminating Varnishes** for decorative, mechanical and electrical applications . . . **Casting Resins** for tools, dies, jigs and fixtures . . . **Bonding Resins** for sand cores, rock wool, glass fibres, abrasives and cork . . . **Resin Glues** for furniture, wood, plywood . . . **Crease-Resistant Resins** for fabrics, textiles.

CATALIN CORPORATION OF AMERICA • ONE PARK AVENUE • NEW YORK 16, N.Y.

MODERN PLASTICS*

VOLUME 28 JUNE 1951 NUMBER 10

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* Reg. U.S. Pat. Office.

Another new development using

B. F. Goodrich Chemical Company *raw materials*



B. F. Goodrich Chemical Company does not make this barrier material. We supply only the Geon materials for the film.

Packed right yet light

TO FIGHT ANY CLIMATE!

WORLD WAR II developed barrier materials highly useful in protecting metal equipment against damage by climate. The new type barrier material pictured here—the foil wrapping—is far superior to World War II types.

Designed to meet government specifications, this wrapping is lighter in weight, thinner and lower in cost. When it is closed, the booster pump will be completely protected against water, chemicals and climate damage. No grease coating is needed.

Laminated to the cotton scrim base and aluminum foil is a Geon vinyl film. The film of Geon reinforces the foil against fracturing. If fractured, Geon provides extra moisture vapor transmission resistance. The Geon film heat-seals uniformly; the wrapping can be closed securely without stitches or metal clips.

Alert manufacturers have found that Geon's many advantages do wonders toward improving or developing products. For Geon resists heat and cold, water, weather and wear, gas, oil and many chemicals. It has dozens of uses for civilian and defense products. Demand now exceeds supply, but limited quantities are available for development work. For technical advice, please write Dept. GA-6, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco.



GEON RESINS • GOOD-RITE PLASTICIZERS . . . the ideal team to make products easier, better and more saleable.

GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers • HARMON organic colors

Check-chart for buyers of

MOLDED PLASTIC PARTS



In buying molded plastics, the most important factor today is your choice of plastics molder. It's well to bear in mind that the success of your product may depend upon his engineering skill, his knowledge and experience, and his production ability and facilities.

Fortunately there are several molders who can meet every requirement to the fullest. But . . . when you're ready to make your choice, be sure to get the answers to these questions:

- ✓ **1.** Has he had many years experience in handling all phases of plastics molding?
- ✓ **2.** Has he a highly successful record in the handling of Government defense contracts?
- ✓ **3.** Does he provide a complete service and assume undivided responsibility for engineering, designing, mold-making, molding and finishing?
- ✓ **4.** Are these services performed within his own organization and under his own supervision and control?
- ✓ **5.** Does he have a capable and experienced engineering staff?
- ✓ **6.** Can he provide the molding method best suited to your job, whether it calls for compression, injection or transfer molding?
- ✓ **7.** Has he the correct size and type of equipment to handle your job most efficiently and economically in the volume you require?
- ✓ **8.** Does he have a reputation among discriminating buyers for doing even the toughest jobs well and making on-time deliveries?

If he can answer all these questions in the affirmative he should qualify as a dependable source of supply.

As for ourselves, we'd like to have you ask us these questions. Or, better yet, let us send you a copy of our booklet which answers each one with an emphatic "YES". It includes intimate views in our 3½ acre plant . . . introduces you to our staff of seasoned engineers . . . gives you an idea of the tremendous scope and extent of our facilities . . . tells a bit about our 30 years of experience in plastics . . . and explains, perhaps, why we have achieved the enviable position we now occupy in the industry. Just ask for Booklet 163-A. There's no obligation.

CHICAGO MOLDED PRODUCTS CORPORATION

1046 N. Kolmar Ave., Chicago 51, Illinois

COMPRESSION, INJECTION AND TRANSFER MOLDING OF ALL PLASTIC MATERIALS.

We'll Have a Fine Future

The mobilization emergency has pointed up a thrilling fact: In the foreseeable future there'll never be too much plastics!

Take styrene, for example. In the peak month of October 1950, we produced about 24 ½ million lb. of styrene, and consumed close to 26 million pounds. But at the April 11 meeting of the Injection Molder's Committee on National Security, G. H. Sollenberger of the N.P.A. Plastics Section observed that even if styrene was at peak production today it would not be possible to satisfy all of the existing injection and extrusion capacity.

But, on top of present molding capacity, the bigger injection machines—60-, 80-, 120-, 180-, 200-, and 300-oz.—are being purchased and installed in surprising numbers. Production on these big machines, currently on refrigeration and television components, is being planned for clothes hampers, cabinets, furniture drawers, even caskets. Right now, production molds are being readied for quantity production of caskets!

Of course the bright future is not exclusively for the large machines. In the packaging field, as just one example, new avenues have opened up within the past few months because it is now possible to vacuum pack olives, nuts, cheese, and other foods in styrene containers.

Since existing machine capacity right now could use upwards of 33 million lb. of styrene per month (considering the large machines, probably closer to 40 million lb.) the most conservative imagination can visualize a market for 50 or 60 million lb. of styrene molding material a month within a decade!

Take the phenolics for another example. When we were producing 12 million lb. a month of phenol, there were those who worried about future over-supply; but today we're using 29 million lb. of phenol, and it is scarce! Two applications of phenolic materials—as foundry mold binders and as binders for wood waste—bid fair to consume as much phenolics as are now used in the molding industry. The use of soft-flow compound for large moldings, the development of electrically conductive plateable phenolic, a new approach to design for thermosets, have already put us in a position where we could be currently using a third more phenolic molding material per month.

Up and down the list the situation is the same. Dry extrusion of cellulose acetate film and sheet alone could presently consume nearly as much of this cellulosic as we are making. Obvious future applications can add immeasurably to that requirement. The vinyls, the possible future over-supply of which is actually worrying some people, have barely gotten a toe-hold in dozens of big volume applications.

Does anybody think that nine million lb. of polyethylene per month could hope to satisfy more than 60% of present civilian demand? Within the next decade this resin can show as much increase in acceptance as did vinyl in the past decade.

Present and coming shortages of metals and other materials during the mobilization program will bring about additional new thinking on plastics applications, will open up more new markets. The proved essentiality of plastics as materials for military applications will increase their acceptance across the board.

We haven't mentioned new resins of which almost every material maker has one or more in pilot stage. The versatility of this industry will thereby increase manyfold and in a short time.

We're going to have a fine future!

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THIS GIANT FILTER PLATE

"couldn't be made satisfactorily"



but...

RICHARDSON is molding it from a NEW Corrosion-Resistant Plastic —developed in the RICHARDSON LABORATORIES

● Sparkler Manufacturing Company, Mundelein, Illinois, faced a tough material problem in designing this 33-inch filter plate weighing 24 pounds for their filtering unit. The filter plate had to withstand the corrosive action of a variety of hot solutions — ranging from weak to strong acids and alkalies. Furthermore, the material had to be strong and non-sagging, with good dimensional stability.

Richardson plastics engineers were called in to help because of their wide experience in material development and part design, and because Richardson molding facilities are unmatched in the industry. Richardson developed a *new* corrosion and heat-resisting plastics material for the job, and precision-molded the part to Sparkler's exact requirements.

Write for illustrated INSUROK Folder

Consult Richardson on Your Special Plastics Jobs

The Sparkler application is typical of hundreds in which Richardson engineers have solved difficult plastics problems for industry. The Richardson Company's unique 4-point plastics service—Materials Development, Engineering, Molding, and Laminating — are available for your benefit.

The RICHARDSON COMPANY

FOUNDED 1858—LOCKLAND, OHIO

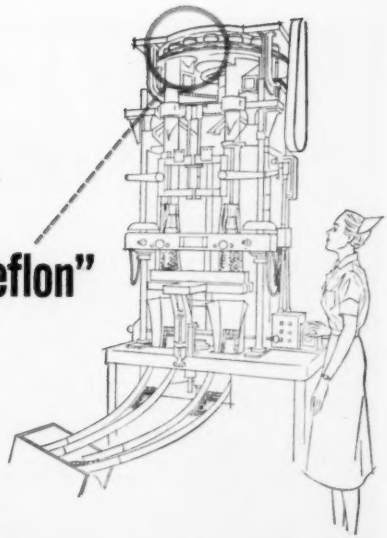
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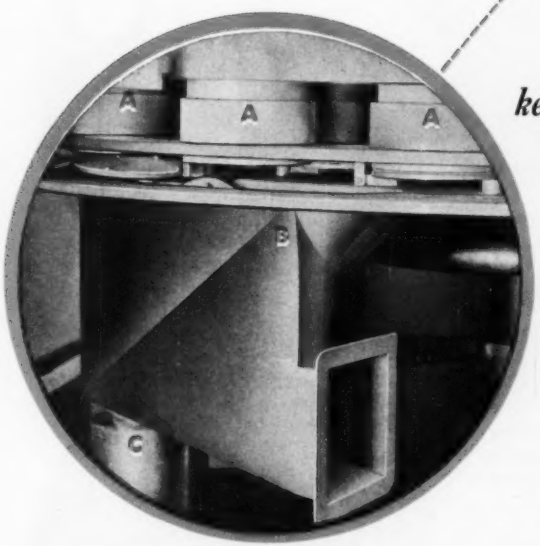
INSUROK
Laminated and Molded Plastics



MELROSE PARK, ILL. INDIANAPOLIS, IND. NEW BRUNSWICK, N. J. NEWNAN, GA. TYLER, TEX. OGDEN, UTAH

Non-adhesive liners of Du Pont "Teflon"





HERE YOU SEE parts of the automatic packaging machine lined with non-adhesive "Teflon." Feeding pockets (A) have trap doors which swing open, dumping product into feeding hopper (B) and, in turn, into packaging tube (C). Pockets, hopper, and tube are lined with "Teflon".

keep sticky foods moving smoothly through packaging process

This machine makes packages at the rate of 50 to 120 per minute, fills them with the manufacturer's product, and seals them. As the food (frozen foods, candy, salted nuts, etc.) is dumped from feeding pockets to hoppers and then down a tube for packaging, it is constantly in contact with the surface of the equipment. Thus, without a non-adhesive lining, particles of food could stick to the equipment, cause improper packaging and costly work stoppage while the machinery is cleaned.

To solve this problem, linings of Du Pont "Teflon"* tetrafluoroethylene resin were installed in Stokes & Smith's "Stokeswrap" machine. Since *nothing* will stick to "Teflon" with any appreciable strength, even the stickiest foods move smoothly through the process without adhering to equipment. Waste and work stoppage are prevented. In addition, dies which make both the end seam and longitudinal seams of the package are lined with "Teflon" to prevent package from sticking to sealing faces.

Industry uses "Teflon" in many operations involving handling of sticky materials. And it has many other uses. "Teflon" is an extremely tough and durable, yet flexible, plastic. It is the most highly heat-resistant and chemically inert of all commercial thermoplastics.

Du Pont "Teflon" may help you, as it has so many companies, to improve a product or process. Demand for "Teflon" currently exceeds supply. However, we suggest you investigate its versatile properties for future application. We will gladly discuss the availability of experimental quantities. For additional information on "Teflon" and other Du Pont plastics, write:

*REG. U. S. PAT. OFF.

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Polychemicals Department, District Offices:
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PLASTICS
Better Things for Better Living
. . . through Chemistry

"Stokeswrap" automatic packaging machine made by Stokes & Smith Co., Philadelphia

Erie Plans Carefully and Tests Relentlessly . . .



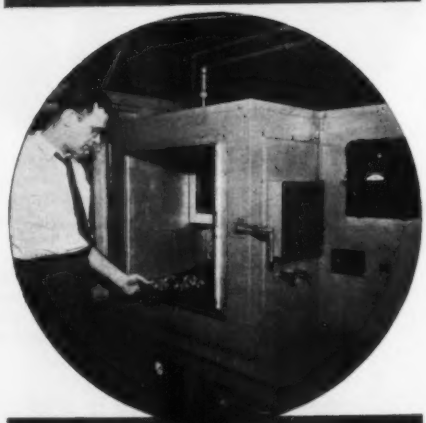
Conference of engineers, production and sales managers over blueprints for new product.



to Give You the Best in Custom Injection Molded Plastics

ERIE has had longer experience in the field of custom injection molding than any other company. ERIE engineers know their plastics and what can be done with them, and have blazed new trails in molding methods. Every new product is gone over thoroughly and in detail, in the "blueprint stage," and dies are designed for most efficient production.

But even expert theory is not accepted as final proof. Your product is subjected to rigorous testing for the conditions it must meet in actual use, in a laboratory in which every such condition is accurately simulated. Whether specifications call for the withstanding of extremes of temperature and humidity, resistance to warpage, precision of dimensions, or other qualifications, scientific quality control methods and equipment give you assurance that the molded products you receive will be up to every required standard.



One of a series of advertisements describing Erie Resistor's complete facilities for quality custom molded plastics.

Plastics Division
ERIE RESISTOR CORP., ERIE, PA.
LONDON ENGLAND . . . TORONTO, CANADA

Are You Up-to-date on Acetate?

The Ace of Playing Cards is *Acetate*



Wherever playing cards are sold or dealt, the name Kem is recognized as a standard of highest quality.

Kem cards are pure Celanese* *acetate*. That's what gives them their satin smoothness . . . the perfect surface for beautiful non-fading colors. They can be washed or wiped clean with a damp cloth again and again. Acetate gives playing cards their long-playing permanence . . . keeps them free of creases or cracks . . . looking as new as the first time they're shuffled.

As with Kem cards, many other products such as lampshades, transparent containers and eyeglass frames can be given added quality and appeal when they are made of Celanese *acetate*.

Celanese Corporation of America, Plastics Division Dept. 101-E, 180 Madison Avenue, New York 16, N. Y. In Canada, Canadian Cellulose Products, Ltd., Montreal and Toronto.

Celanese*

*Reg. U. S. Pat. Off

PLASTICS

vinyl embossing

With the introduction of its Vinyl Embossing attachment, Frank W. Egan & Company offers new, time-saving advantages to plastic processors everywhere.

The economical Egan attachment—designed to fit your own calender—converts vinyl embossing into a one-operation process. It will operate at 50-80 yards per minute, with no sacrifice in speed of the calender to which it is attached. No rehandling is necessary . . . the engraved roll is easily interchangeable with other patterns.

Write for quotation or invite our representative to call.

at calender speed



FRANK W. EGAN & COMPANY
Bound Brook, New Jersey

Designers and builders of: Treaters, Film Casting Machines, Laminators, Air Dryers, Coaters, Printers, Embossers, Winders for the Plastics Industry.

Cable Address: "EGANCO"—BOUNDBROOK, N.J.

New Horizons

IN PLASTICS



New 76-Ton GIANT Molding Machine
300-Ounce Capacity . . . World's Largest . . . 4 x 6 Foot Mold . . . 1500 Tons Clamping Pressure . . . Ready To Go To Work For Y-O-U At AMOS

YOU SET YOUR SIGHTS on *brighter, wider* horizons when you select AMOS for all your requirements in thermoplastics—civilian or military—because . . .

AMOS BRINGS YOU the world's *largest, finest* equipment—in a model, modern plant—right in the heart of the industrial Midwest.

AMOS BRINGS YOU the *ability* and *facilities* to do your *complete* job in plastics—DESIGN, ENGINEER, TOOL, MOLD and FINISH. Undivided responsibility all under one roof!

AMOS BRINGS YOU *knowledge* which comes with experience . . . and *goodwill* which develops through many years of pleasing customers.

AMOS BRINGS YOU skilled, *painstaking* personnel with the customer's—*your*—point of view.

THESE ARE THE ASSETS that influence alert, well-informed manufacturers—with a keen sense of values and a receptive attitude toward change, when change means *product improvement*—to select AMOS for the *finest* in Custom Injection Molding.

Amos
MOLDED PLASTICS...
EDINBURG, INDIANA
Offices: NEW YORK, CHICAGO, DETROIT, PHILADELPHIA



HERESITE

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M-66 TRANSPARENT THERMOSETTING MOLDING COMPOUND



Illustrated are a variety of parts molded from M-66 Transparent Amber Phenolic Molding Compound. Its transparency, coupled with complete resistance to sterilization temperatures, makes it ideal for many applications in the television, radio, electronics, hospital and dairy industries.

The molding of the M-66 requires no unusual skill, or technique to obtain satisfactory results. It may be molded to close tolerances by either the compression or transfer method.

AVAILABLE IN VARIOUS COLORS

For additional information write

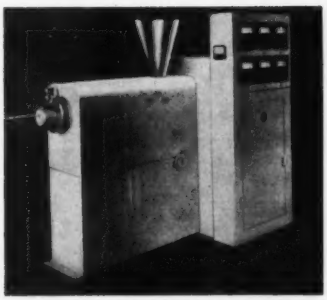
HERESITE & CHEMICAL COMPANY

MANITOWOC, WISCONSIN

Smooth sailing ahead

for owners of MPM extruders





Regardless of predicted conditions, owners of MPM extruders can direct their course toward defense work or peace time products by interchanging of dies or materials.

IF you are compelled to shift to different materials or to rework scrap due to shortages, the versatile MPM heat control system is of most importance. Your MPM extruder successfully handles a wide range of plastics.

IF you are forced to operate week after week, month after month without letup, you'll only be asking your MPM extruder to do the job it was designed for. All parts that contact the plastic resins are of solid corrosion resistant materials, hardened for maximum wear.

IF you need additional dies to make film, covered wire, monofilaments, tubing or any other cross section required for defense work, MPM can design and supply them. Auxiliary equipment to make complete installations for such products will also be available.

IF you are about to produce a new extruded product, MPM may be in a position to supply all necessary additional equipment along with suggestions that could save you time and money.



15 Union St., Lodi, N. J., U. S. A.
Cable Address: MODPLASEX



PLASTICS FOR INDUSTRY

The Murray Co. of Allentown, Pa. selected Cruver to produce a decorative nameplate for their fine line of electric stoves

The nameplate is molded in acrylic and decorated in brite silver and white using Cruver's Bas Reelef method.

The finished nameplate is then mounted in a Metal bezel as shown in the above illustration.

CRUVER

MANUFACTURING CO.

2460 W. JACKSON BLVD., CHICAGO 12, ILL.

BRANCH OFFICES

DETROIT MINNEAPOLIS NEW YORK

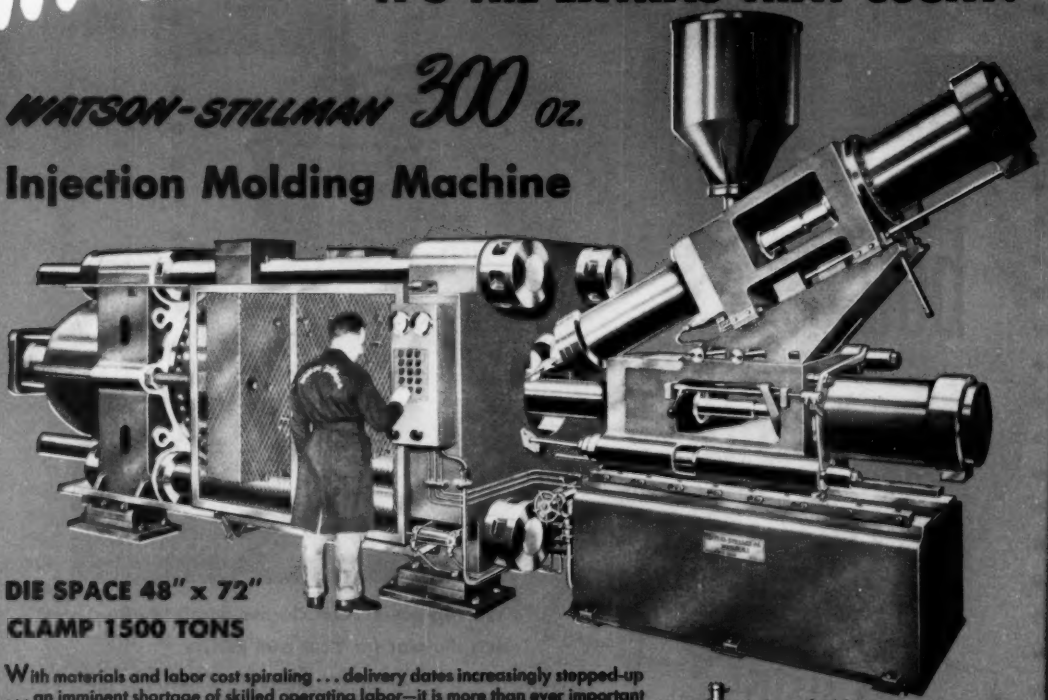
CLEVELAND ST. LOUIS

In times like these...

IT'S THE EXTRAS THAT COUNT!

WATSON-STILLMAN 300 OZ.

Injection Molding Machine



DIE SPACE 48" x 72"

CLAMP 1500 TONS

With materials and labor cost spiraling . . . delivery dates increasingly stepped-up . . . an imminent shortage of skilled operating labor—it is more than ever important for PLASTIC MOLDERS to know *all* their suppliers . . . and *everything* each has to offer.

As THE pioneer and fifty-two-year consistent leader in the design and construction of Plastics Molding Machinery, W-S is in an especially good position to offer molders of every size and type a *complete* service. Not only the finest and most extensive line of molding machinery anywhere available . . . but extra dividends in the form of engineering counsel on materials, die-design, and plant layout.

In times like these, such *extra* service, *extra* attention to every vital phase of your operation is increasingly valuable. Because of its machine capacity range of 1-300 ounces, and the broadest range of injection, compression and transfer molding machines, W-S is your logical consultant on any projected expansion. And once you have enjoyed the advantages of COMPLETELINE service—extending far beyond equipment needs alone—you will always consult W-S first on new molding equipment *and how to use it*.



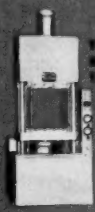
2 Ounce Semi-Automatic Injection Molding Machines.



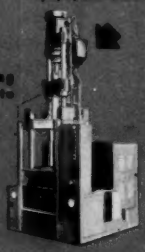
Preform Tableting Machines—10 and 100 Tons.



Compression Molding Presses — 50 to 1200 Tons.



Transfer Molding Machines—35 to 1200 Tons.



Vertical Injection Molding Machines—1, 2, 4, and 6 ounces.

WATSON-STILLMAN

HYDRAULIC MACHINERY DIVISION - Estab. 1848

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Branch Office: 228 No. La Salle St., Chicago, Illinois

Manufactured in Canada by—Canadian Vickers, Ltd., Montreal

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OUR SERVICE

As the world's leading Plastics Scrap Reclaimers we offer the almost unlimited facilities of our vast plant to industry in these days of shortages in all basic raw-materials.

We have available over 150,000 sq. ft. of floor space devoted exclusively to the processing of plastics — virgin and scrap — resinous materials or by-products.

We specialize in the reduction to small particles — to your most exacting specifications — of all lumps, blocks, mill ends, bleeder waste — regardless of size and whether rigid or soft.

We also custom-compound *all* thermoplastics to your specifications.

We offer
the World's finest facilities for:
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We reprocess *Your* Plastics Scrap, By-Products, Surplus for *Your* own Re-Use.
We have complete laboratory facilities for Testing, Analyzing, and Pilot Running of Customer's Materials.

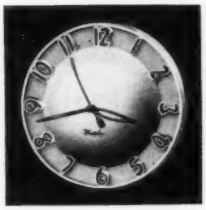
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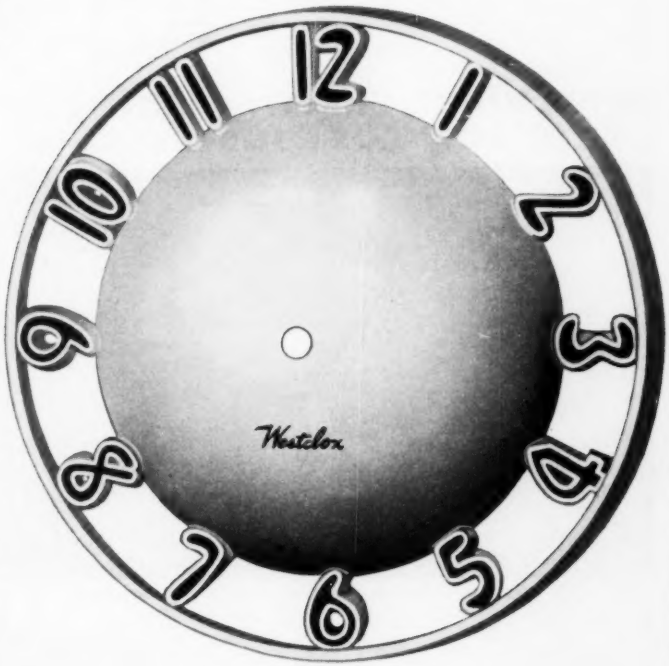
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CORPORATION
PLASTICS MATERIALS
703 Bedford Avenue, Brooklyn 6, N. Y.
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Where time is money



. . . It's PLASTICS every time!



Time is big money to Westclox—and this up-to-the-minute new electric Westclox Melody is on its way to a sales record. It's a brilliantly-styled decorator's ideal—with a reversible or removable case ring to change its appearance at will. It is very appealingly priced. And there you have two of the many reasons why—no matter what your product—moulded plastics by Kurz-Kasch deserve your most careful appraisal.

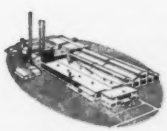
The entire clock case—numerals and all—is a 1-piece compression moulded job. Because of its color range, dimensional stability and characteristic of preserving its soft, lustrous finish when cleaned with any fluid, the material is urea. Numeral colors are masked and sprayed on—the trademark color is quickly rolled on the raised letters.

Simple? Sure—when you know how to do it! At Kurz-Kasch we try—by design and materials—*to make every job as simple as possible.* That's the best way to keep your costs in line. And we work as hard on that as we do in excelling in quality—or on our punctuality in fitting shipments into our customers' production schedules to the best of our ability.

Our specialty is thermosetting plastics—from phenolics to Teflon and moulded glass-filled polyester. We have researched and developed new methods and new uses. We would like to discuss this with you.

Kurz-Kasch

FOR OVER 35 YEARS PLANNERS AND MOULDERS IN PLASTICS



Kurz-Kasch, Incorporated • 1415 South Broadway • Dayton 1, Ohio

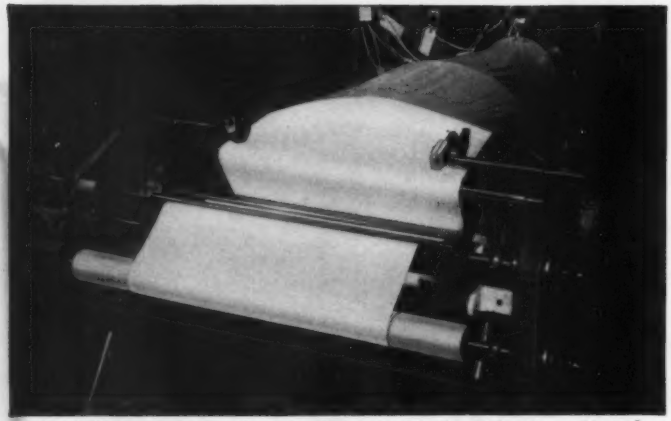
BRANCH SALES OFFICES: New York, *Lexington 2-6677* • Rochester, *Hillside 2415M* • Chicago, *Harrison 7-5473* • Detroit, *Trinity 3-7050* • Philadelphia, *Granite 2-7484* • Dallas, *Logan 5234* • Los Angeles, *Prospect 7503* • St. Louis, *Delmar 9577* • Toronto, *Girard 9711* • **EXPORT OFFICE:** 89 Broad Street, New York City, *Bowling Green 9-7751.*

PLASTICS MACHINERY BULLETIN

Reporting News and Machine Design Developments

IN BUSINESS TO **NRM** REDUCE YOUR COSTS

NEW! VINYL SHEETING EXTRUDED WITH LOW-COST INSTALLATION



New NRM extruder produces sheeting in thicknesses of .005" to .015", and a possible .020".

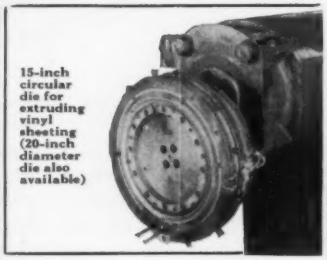
The first machine to extrude heavy-gage polyvinyl-chloride sheeting (.005" to .015" —.020") has now been developed and tested at NRM's laboratories. Cost of a complete unit is but a fraction of the cost of a calender installation.

Quality of the extruded sheeting is equal or better than that of sheeting produced by calenders. Gage tolerances are broader, and output speeds less. Thus the economy of the new method can best be realized on applications where high speed and close tolerances are not imperative.

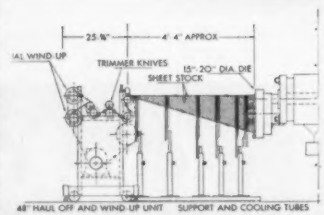
Overall length of the unit, including drive, is approximately 21 feet.

NRM also produces a unit for the extrusion of thin-wall expanded polyethylene and PVC tubing for wall thicknesses from .001" up.

Write for complete information. Plastics Machinery Division, National Rubber Machinery Company, Akron 8, Ohio.



15-inch circular die for extruding vinyl sheeting (20-inch diameter die also available)



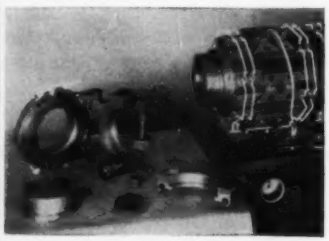
Extruder head and haul-off unit.

ELIMINATES PREDRYING SIMPLIFIES COMPOUNDING AND COLOR BLENDING

The new NRM two-stage single-screw extruder, which eliminates the need for initial compounding and drying, has been applied successfully for the extrusion of pre-blended wet acetate, acrylic, and polystyrene compounds to be pelletized direct at the die or in a chopper. It can now be applied for the direct extrusion of certain finished products. Thus compounds can be made to specifications quickly from a simplified inventory of basic materials such as resins, plasticizers, stabilizers, fillers and dyes, and a finished product can be obtained from one machine.

New Nylon Extruder

The NRM simplified, rugged, split-front flange arrangement holding a standard die gate or PVC crosshead can be removed readily and replaced with a band heater,



NRM 2½" Model "50" die gate, sub-die, strainer plate and split-type front flange as removed from cylinder front end of a 2½" extruder. A nylon crosshead or nylon die can now be bolted direct to the cylinder face.

when the small *Nylon* die or *Nylon* crosshead is bolted directly to the face of the cylinder. This avoids critical temperature variations resulting from heat losses of the flange.

For complete details, write Plastics Machinery Division, National Rubber Machinery Company, Akron 8, Ohio.

NATIONAL RUBBER MACHINERY CO.

General Offices & Engineering Laboratories
Akron 8, Ohio

PLANTS at Akron and Columbiana, Ohio and Clifton, N. J.
AGENTS East: National Rubber Machinery Co., Clifton, N. J.
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EXPORT Plastics Machinery: OMNI EXPORT CORPORATION
460 4th Ave., New York 16, N. Y.

Creative Engineering



the CASEIN PLASTIC

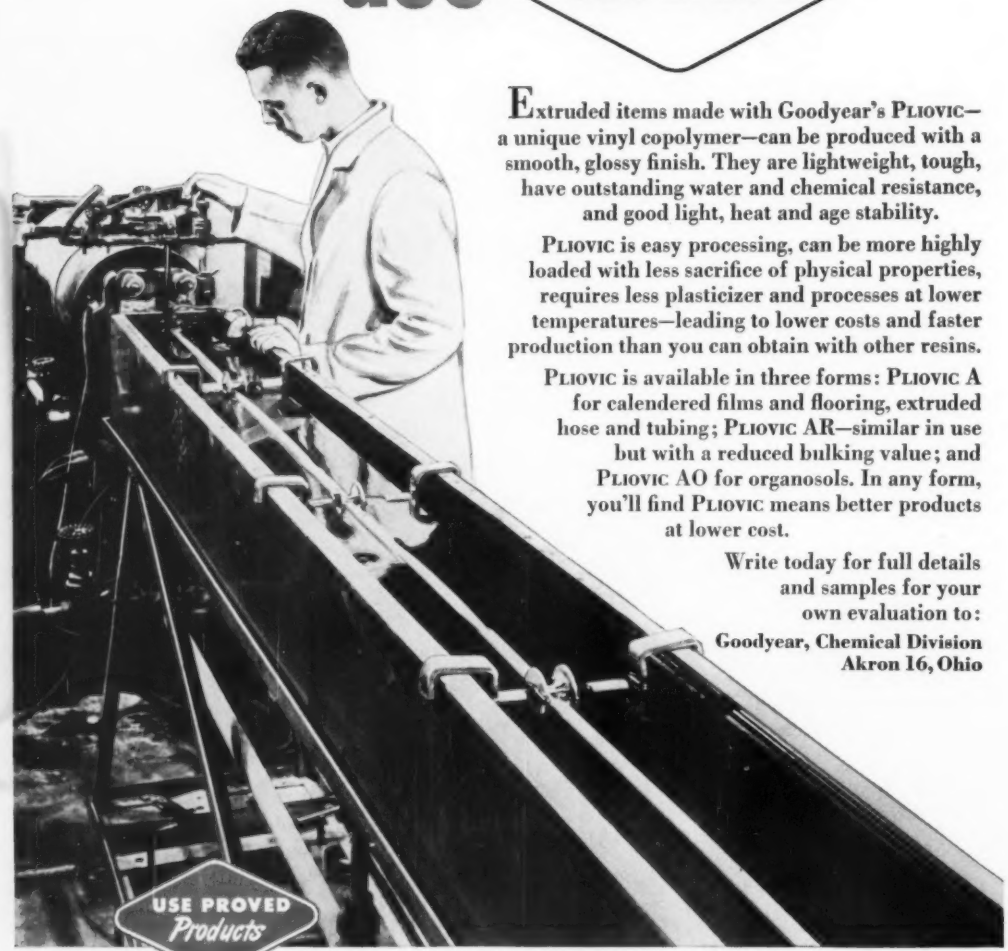
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and a variety of effects

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For better extrusions use PLIOVIC



Extruded items made with Goodyear's PLIOVIC—a unique vinyl copolymer—can be produced with a smooth, glossy finish. They are lightweight, tough, have outstanding water and chemical resistance, and good light, heat and age stability.

PLIOVIC is easy processing, can be more highly loaded with less sacrifice of physical properties, requires less plasticizer and processes at lower temperatures—leading to lower costs and faster production than you can obtain with other resins.

PLIOVIC is available in three forms: PLIOVIC A for calendered films and flooring, extruded hose and tubing; PLIOVIC AR—similar in use but with a reduced bulking value; and PLIOVIC AO for organosols. In any form, you'll find PLIOVIC means better products at lower cost.

Write today for full details and samples for your own evaluation to:

Goodyear, Chemical Division
Akron 16, Ohio

GOODYEAR

Pliovic—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

METALMASTERS, INC.

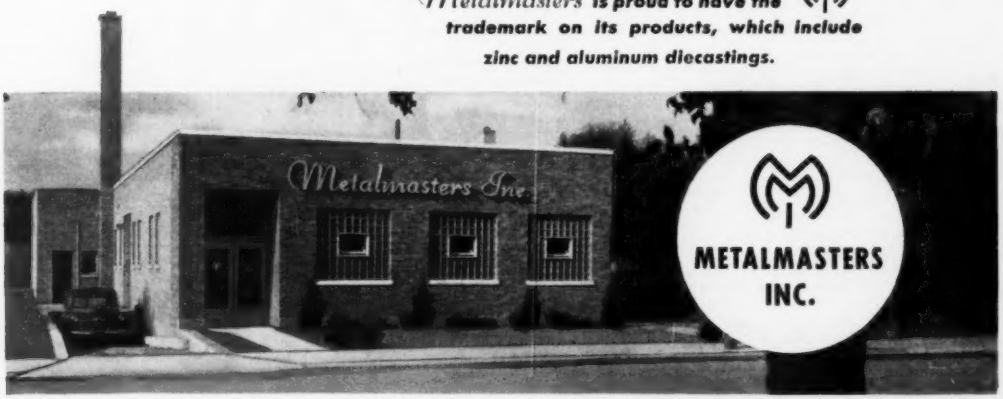
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PLASTIC INDUSTRY

Behind the trademark stands a highly experienced personnel, with modern equipment and facilities to satisfy the most exacting specifications.

Metalmasters, Inc., ***is serving the plastic industry specializing in HOBS and HOBBED CAVITIES for plastic molds, where quality and service are stressed consistently.***

Metalmasters ***is proud to have the trademark on its products, which include zinc and aluminum diecastings.***



5292 NORTHWEST HIGHWAY • CHICAGO 30, ILLINOIS



You can double the life of most vinyl compounds...

with DYPHOS

"Dutch Boy" Stabilizers

PRODUCT	USE
TRI-BASE (Tribasic Lead Sulphate)	Electrical and other compounds requiring high heat-stability
TRI-BASE E (Basic Lead Silicate Sulphate Complex)	Low volume cost insulation
DS-207 (Dibasic Lead Stearate)	Sheeting, extrusion and molded compounds, i.e., insulated wire and vinyl phonograph records
PLUMB-O-SIL A (Co-precipitate of Lead Orthosilicate and Silica Gel)	Translucent and colored sheeting and upholstery stocks
PLUMB-O-SIL B (Co-precipitate of Lead Orthosilicate and Silica Gel)	Translucent film and sheeting, belting
PLUMB-O-SIL C (Co-precipitate of Lead Orthosilicate and Silica Gel)	High grade insulated wire and sheeting
DYTHAL (Di-basic Lead Phthalate)	General purpose stabilizer for heat and light
DYPHOS (Di-basic Lead Phosphite)	Excellent for heat and light in all opaque stocks, including Plastisols and Organosols
NORMASAL (Normal Lead Salicylate)	Vinyl flooring and other compounds requiring good light-stability

Dutch Boy* CHEMICALS

*Trademarks Reg. U. S. Pat. Off.

Greatly increased service life for your opaque vinyl products—unequalled light- and heat-stability—excellent color retention—lasting flexibility . . . these are advantages of stabilizing with "Dutch Boy" DYPHOS.

"Dutch Boy" DYPHOS is effective in upgrading quality because it has all four properties of the ideal stabilizer:

(1) Acid acceptor; (2) Reactive molecule; (3) Anti-oxidant; (4) Ultra-violet light screening agents.

This is shown by accelerated tests in the laboratory and by actual outdoor exposure tests.

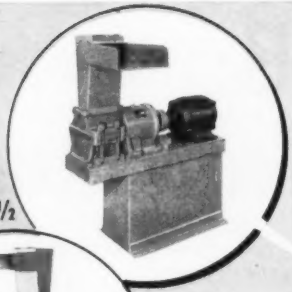
Most vinyl formulations with DYPHOS show a *useful life at least twice* that of similar compounds using other stabilizers.

DYPHOS is recommended for high-quality vinyl compounds, including plastisols; also for systems using chloroparaffins as secondary plasticizers.

For complete factual data on DYPHOS and other "Dutch Boy" chemicals . . . for technical assistance in evaluating their use in your operations . . . write us.

NATIONAL LEAD COMPANY

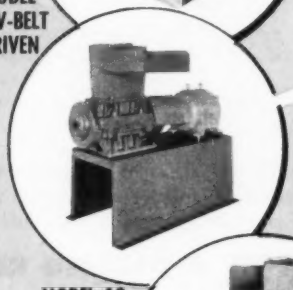
111 Broadway, New York 6, N. Y.



MODEL ½



MODEL ½ V-BELT DRIVEN



MODEL 18



MODEL 10
(6" x 10" throat opening)

There's a CUMBERLAND GRANULATOR that's *RIGHT FOR YOU!*

YOU'LL GRANULATE MORE ECONOMICALLY WITH A CUMBERLAND MACHINE THAT'S BUILT-FOR-THE-JOB.

Each granulating job in your plant has its own specific problems. Only a granulator that's built-for-the-job can do the job most efficiently.

Whether you granulate combs or television cabinets, brittle or elastomeric materials, there's a Cumberland granulator designed to meet your needs. Each machine is easy to operate, easy to clean, and extremely rugged.

We'll be glad to help you analyze your needs and recommend the granulator that's exactly right for you!

For more information, write for Bulletin 250.

OTHER CUMBERLAND MACHINES



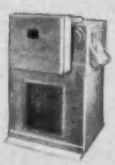
NEW PREBREAKER

Cuts up radio, television cabinets and other large parts. Two machines available: Model 32 (20" x 32" throat opening); Model 24 (10" x 24" throat opening). Write for details.



ROTARY CHOPPING MACHINE

Heavy duty, rugged machine. Used for cutting thick vinylite slabs from two roll mills. Also used as large capacity pelletizer. Other applications are described in Bulletin 400.



PELLETIZING MACHINE

Smaller, companion model to Rotary Chopper. Designed specifically for use with continuous extruders. Gives efficient, trouble-free performance. Write for complete details.

CUMBERLAND *Engineering Company Inc.*

BUILDERS OF BETTER MACHINES FOR THE PLASTICS INDUSTRY

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Proximity Rings the Bell in Molding or Matrimony!

You know the story. American boys overseas were marrying foreign girls.

A worried sweetheart, stateside, wrote her soldier. "What have those girls got that we don't have?"

He answered. "Not a thing. Not a thing. But they've got it here."

Proximity's important—in a fuze, a romance, or a molder-client relationship. If your plant is in Kankakee or Nacogdoches or Walla Walla you'll find good molders nearby.

Here in the East remember that what it takes to solve your molding problems we've got—here.

We work no miracles. But our talented molders, with skill developed over 30 years of molding most moldable plastics . . . can handle many jobs others might call "impossible".



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BOONTON, NEW JERSEY
N. Y. Office—Chanin Bldg., 122 East 42nd Street, Murray Hill 6-8540

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ELECTRONIC SEAMER

FOR BOND-SEAMING THERMOPLASTICS

Makes Seams

- Watertight
- Airtight
- Nearly Invisible
- Stronger Than Material



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SPECIAL ATTACHMENTS

for making edge folds, tie strings, belting, binding, and for half lap seam felling and numerous other operations.

Here's a machine that provides you with neat, perfectly bonded thermoplastic seams at fingertip-controlled speeds ranging from 3 to as high as 50 feet per minute! The SINGER Electronic Seamer takes straight seams, curved seams and sharp corners in its stride. Has easily adjustable thickness control. Starts and stops instantaneously without affecting smooth, even quality of seam. Will bond-seam almost any thermoplastic material, calendered or cast. Tacks and spot seals, too. Ask for illustrated leaflet describing this machine and its many applications or talk to your nearest SINGER Shop for the Manufacturing Trade about seam-testing your samples.

SINGER SEWING MACHINE COMPANY

Manufacturing Trade Department • Branches In All Principal Cities

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Designed by Charles Eames and distributed by Herman Miller, this sleek modern chair is a top prize winner in the Museum of Modern Art's low-cost furniture competition and a sensational sell-out wherever it's been shown.

To best interpret the striking design . . . to provide rugged durability . . . the molder, Zenith Plastics Company, Gardena, California, chose a unique new construction material—Fiberglas* reinforced plastic. Result: A complicated, deep-drawn shape molded in one quick and easy operation.

Even though increasing military demands are restricting large volume supply of Fiberglas reinforcing materials for civilian uses, it will pay you now to consider these versatile, low-cost materials for future use. Why not write us today for details.

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CUSTOMERS RE-ORDER with confidence from NORTON



CUSTOMER: WEST BEND ALUMINUM COMPANY
WEST BEND, WISCONSIN

PIPING HOT foods and liquids are prepared in these West Bend kitchen appliances. But properly designed handles, molded by Norton, make them a cinch to manage.

If customers had not been pleased with the plastic components molded over the years by Norton, West Bend would not have returned as they have done, time and time again, with new molding jobs.

There are important reasons for West Bend's satisfaction with the parts Norton molds for them: like all Norton customers they value sound engineering counsel, sensible pricing, flawless molding, dependable deliveries and all-around cooperative service.

Spanning the years, Norton has molded thousands of articles for hundreds of customers. Repeat orders prove their satisfaction.

Norton is interested in cultivating your molding business, too. Ask for a free survey of your next molding assignment by a Norton engineer from our nearest sales office. Write today. Norton Laboratories, Inc., Lockport, New York. Sales Offices: *New York—175 Fifth Avenue; Chicago—5221 Kimbark Avenue.*

NORTON *Laboratories, Inc.*

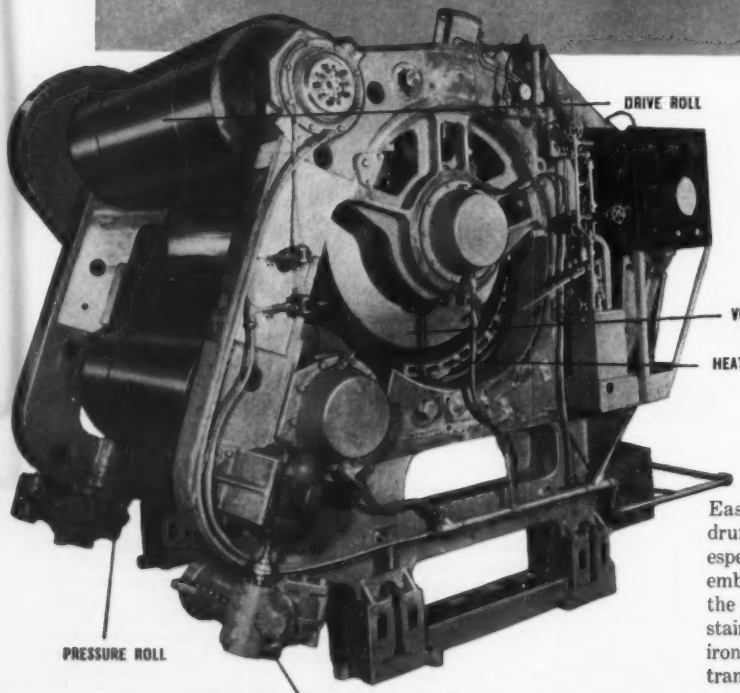
COMPRESSION AND INJECTION MOLDING

A completely new and redesigned

FOR CONTINUOUS

Permits roll and belt

A NEW ROTOCURE, DESIGNED TO GREATLY FACILITATE REMOVAL OF THE VULCANIZING DRUM AND REPLACEMENT OF THE STEEL BAND, IS NOW AVAILABLE AS A RESULT OF COOPERATIVE ENGINEERING BY ADAMSON UNITED COMPANY AND BOSTON WOVEN HOSE AND RUBBER COMPANY



Easy removal of the Vulcanizing drum to make quick roll changes is especially important when use of an embossed curing roll is necessary, as in the production of floor matting and stair treads. The changing of edge irons when producing conveyor or transmission belting is also facilitated.

The pressure (gauging) roll will withstand a separating force of 250,000 pounds per adjusting screw. It is contemplated that certain stocks can be calendered and cured in a single operation, gauging being accomplished between the pressure roll and the curing roll.

ADAMSON UNITED COMPANY

AKRON 4, OHIO

SUBSIDIARY OF UNITED ENGINEERING & FOUNDRY COMPANY

BRANCH OFFICES IN PRINCIPAL CITIES

ROTOCURE*

VULCANIZATION

changes in 1/10th the time!

One piece housings provide adequate "window" clearance for removal of the curing roll. A special "C"-Hook is furnished for supporting the roll as illustrated. All design details have been engineered to facilitate and speed roll changing. For example, all supply and return lines are quick-disconnect type. The heating shoes surrounding the Vulcanizing roll are automatically retractable.

Some desirable features:

- **All rolls are supported in self-aligning roller bearings, oil flood lubricated.**
- **Speed range is adjustable from ½ to 6.2 feet per minute.**
- **Vulcanizing roll is 60" diameter; 80" face.**
- **Tension roll is hydraulically actuated; maximum belt tension, 240,000 pounds.**

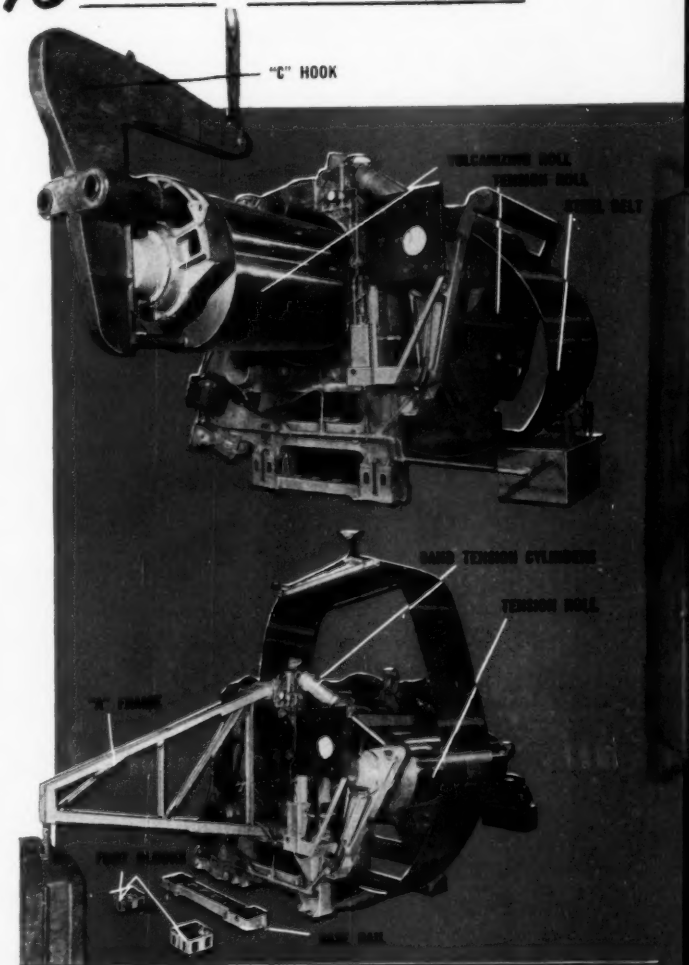
Easy replacement of the steel band is made possible by the ingenious arrangement illustrated. After the curing roll has been removed, the specially provided "A-Frame" is bolted in place and jacked up far enough to remove the weight from the base rail on the near side. The two "foot blocks" are then taken out, permitting the belt to be removed through the resulting opening.

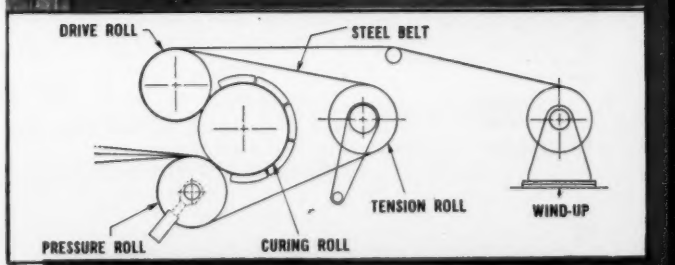
Operation of the Rotocure is shown schematically at right. The Rotocure has many advantages over the conventional press on large production runs. For example:

- **Increased production provided by continuous operation, which eliminates opening, cooling, reheating and closing.**
- **Elimination of overcuring and undercuring of the over-lap areas occurring on conventional presses.**
- **Greater uniformity of stretch.**

Our engineers are available for consultation concerning the possibilities of the Rotocure for your particular products.

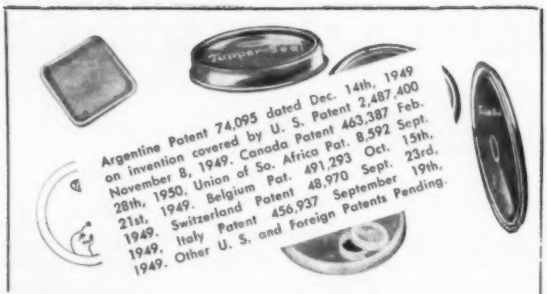
**The Rotocure machine is a patented development of Boston Woven Hose and Rubber Company built by Adamson United Company under a licensing arrangement.*







Tupper Seal, air and liquid tight flexible covers fit, and are included in the sets of all Tupperware Canisters.





There's a Tupper Seal, air and liquid-tight flexible cover for Tupperware 2, 5, 8 and 12½ oz. Tumblers too, and these Tupper Seal, covers fit many other containers of metal, glass and crockery.

TUPPER! Seals

air and liquid-tight, flexible covers for Tupperware Tumblers, Canisters, Wonder Bowls, Cereal Bowls and many another container of glass, metal and pottery, the contents of which it is desired to keep fresh and wholesome.



TUPPER!

The Tupperware Bread Server which serves as a bread tray also is designed to give similar results as Tupper Seal, air and liquid-tight Flexible covers. Keeps contents fresh as no other such container.



The Tupperware 50 oz. Canister is "standard equipped" with the Tupper Seal, air and liquid-tight flexible Pour All cover.



The Tupper Seal, air and liquid-tight flexible Pour All cover is used on every Tupperware 20 oz. Canister.

FORMAL NOTICE! 9th November, 1949

EXCLUSIVE!

U. S. Patent #2,487,400

The Tupper Corporation has attained a position of leadership in this industry by incurring great expense and expending painstaking effort in the development, design, manufacture and exploitation of its many world-known products.

The Tupper Corporation further has anticipated the inevitable attacks to which leadership is subject and has taken measures provided by law to preserve the creative rights to its products, methods and design by patent protection both in the United States and abroad.

Tupper Seals for Tupperware shown in this advertisement are just a few of the forms covered in this manner and are specifically covered by U.S. Patent #2,487,400.

Only the Tupper Corporation, by U.S.Patent #2,487,400 has the right to make, use and vend container closures in connection with any and all types of containers throughout the United States and its territories as covered by the claims of the Patent.

Tupper Corporation will protect, according to law, the exclusive rights above granted

TUPPER CORPORATION



The Tupper Seal, air and liquid-tight, Pour All cover as a cover for 46 oz. cans; Tupperware Sauce Dishes and other containers of metal, glass or pottery. Foods easily dispensed without removing entire cover.



When equipped with Tupper Seal, air and liquid-tight, flexible covers, Tupperware Cereal Bowls serve many another purpose.



The Tupperware Wonder Bowls are usually fitted with Tupper Seal, air and liquid-tight covers.



The Tupper Seal, air and liquid-tight flexible cover made for Tupperware 8 oz. Tumblers also fits and is sold with all Tupperware Funnels as a base when funnels are used as storage containers.

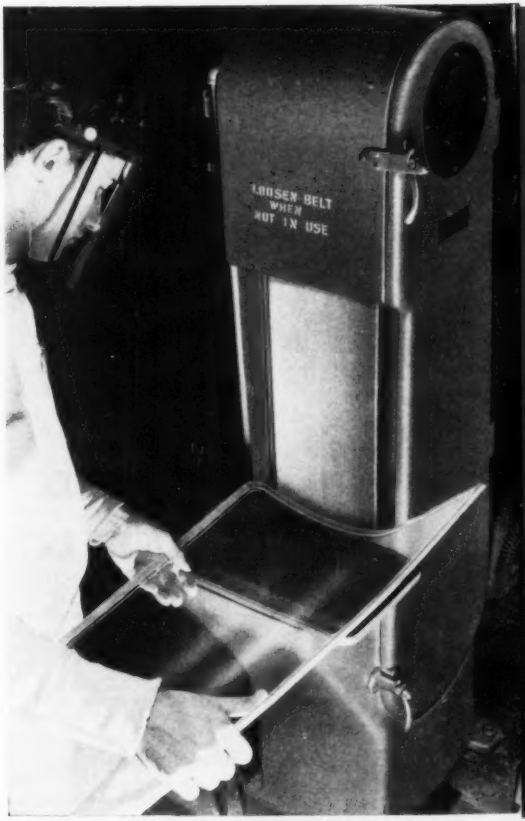
TUPPER CORPORATION

Manufacturers of — CONSUMER, INDUSTRIAL, PACKAGING AND SCIENTIFIC PRODUCTS

FACTORIES: Farnumsville, Mass., and Cuero, Texas **New York Show Rooms 225 Fifth Ave.**

ADDRESS ALL COMMUNICATIONS TO: Department B

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STURDY, DURABLE and DEPENDABLE



Waterproof Cloth Belts by CARBORUNDUM operate with long-lived efficiency in wet sanding of plastics and other ductile materials subject to plastic flow. They feature hard, sharp silicon carbide abrasive grain, firmly bonded to a pre-stretched resin-filled cloth backing. "Wet stretch" is retarded, reducing tensioning adjustment down-time. Fast initial cut and long life uniform thickness prevents "bumping" at splice. Your CARBORUNDUM representative will be glad to give you full details about these and other advantages of Waterproof Belts by CARBORUNDUM. Get in touch with him *now!*

Only CARBORUNDUM

TRADE MARK

makes ALL Abrasive Products ...to give you the proper ONE

"Carborundum" is a registered trademark which indicates manufacture by The Carborundum Company, Niagara Falls, N.Y.

Chemicals you live by

IMPROVE YOUR...

LAMINATES

with DIAMOND PRECIPITATED CALCIUM CARBONATES

Laminators and molders find that smoother surfaces, elimination of cracks and of evidence of glass fibres result when DIAMOND Precipitated Calcium Carbonates are mixed with catalyzed, glass-reinforced polyester resins. This is due, in part, to the more even rate of cooling induced by the carbonate filler.

Other advantages in using DIAMOND Precipitated Calcium Carbonates are improved wet strength of the polyester resin, reduced shrinkage and, of course, *lower raw material cost.*

DIAMOND ALKALI offers several grades of Precipitated Calcium Carbonates, each chemically produced under carefully controlled conditions to assure day-to-day uniformity of particle size and purity.

Specifically recommended for reinforced polyester resins are:

SURFEX* — **coated with 1% resin; particle size about 10 microns.**

SUSPENSO* — **same as SURFEX except uncoated.**

KALITE* — **coated with 1% stearic acid; particle size about 1 micron.**

MULTIFEX* MM — **uncoated, particle size about 0.06 micron.**

For further information write for DIAMOND's Bulletin "The Use of Precipitated Calcium Carbonates in Polyester Resins". Our Technical Service Staff is also available to assist you on formulating problems. *®

DIAMOND SALES OFFICES: New York, Philadelphia, Pittsburgh, Cleveland, Cincinnati, Chicago, St. Louis, Memphis and Houston. Also representatives in other principal cities.

DIAMOND CHEMICALS FOR PLASTICS COMPOUNDING

DIAMOND ALKALI COMPANY...CLEVELAND 14, OHIO

DIAMOND ALKALI CHEMICALS

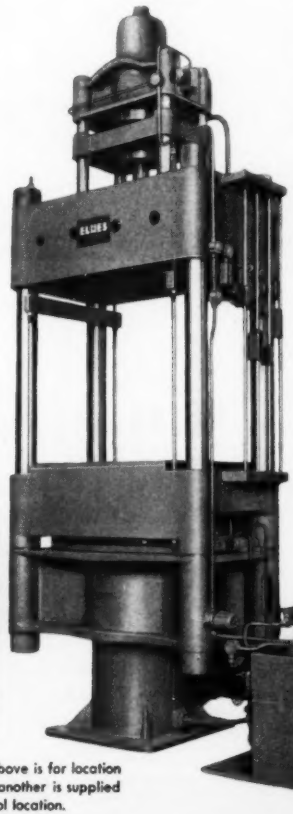
NEW *Elmes* HYDRAULIC MOLDING PRESS

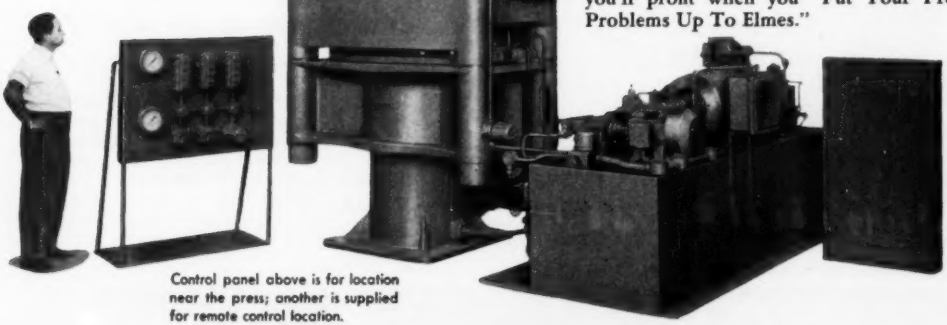
specially designed for
HAZARDOUS LOCATION

Since the pioneering days of molding, Elmes Presses have meant dependable, economical performance. Whether your requirements call for a press of entirely new design or one embodying modifications of an existing design—or can be met with a standard compression or transfer press—an ELMES is your assurance of complete press satisfaction. Recommendations and cost estimates are yours for the asking.

ELMES 100th Anniversary 1851-1951 HYDRAULIC EQUIPMENT

500-ton Combination Transfer and Compression Molding Press





Control panel above is for location near the press; another is supplied for remote control location.

For defense as for civilian production, Elmes engineers design presses that fit customers' requirements *exactly.*

The press shown here is a typical example. This is a combination transfer and compression molding press. Designed for use in a hazardous location, the press has two pushbutton control panels—one (shown in photo) located near the press, and another in a separate room providing complete remote control.

The press can be changed from straight compression to transfer molding simply by flicking a switch. In the compression cycle, the circuit is arranged to provide two breathe cycles. Opening of the breathe can be controlled to ¼ inch. Curing cycle is set by a motor-type timer and can be furnished with any required range. Pump is equipped with compensating control, so that during the curing cycle only the essential minimum of horsepower is used. The mechanical knockout is hydraulically operated, and is *fully automatic.*

Whatever your requirements in molding presses, you'll profit when you "Put Your Pressing Problems Up To Elmes."

American Steel Foundries

ELMES ENGINEERING DIVISION

1159 TENNESSEE AVENUE, CINCINNATI 29, OHIO

DISTRIBUTORS IN PRINCIPAL INDUSTRIAL CENTERS —— ALSO MANUFACTURED IN CANADA

METAL-WORKING PRESSES • PLASTIC-MOLDING PRESSES • EXTRUSION PRESSES • PUMPS • ACCUMULATORS • VALVES • ACCESSORIES

QUALITY
Glidden
PRODUCTS

Research, Pigments and YOU!

Research, life blood of the diversified Glidden industrial team, has been the biggest single factor in the development and never-ending improvement of the Glidden family of pigments. The Chemical and Pigment Company, with three laboratories of its own, plus the benefit of cooperative research among 32 separate Glidden laboratories, produces the best pigments modern science can develop. And *YOU* get the end benefit—in superior pigment performance.

THE GLIDDEN FAMILY OF QUALITY PIGMENTS

CADMOLITH* COLORS

... each one a leader in its field!

Government Order NPA-M 19 restricts the use of pigments made from cadmium metal in the present emergency. Cadmolith Reds and Yellows, which offer a combination of advantages found in no other red and yellow pigments, are in limited production at this time. Samples gladly furnished on request.

SUNOLITH* LITHOPONE

A superior pigment for flat wall paints, undercoaters, water base paints, rubber and many allied products.

ZOPAQUE* TITANIUM DIOXIDE

A pure titanium dioxide offering excellent color and hiding power plus unexcelled working properties.

*Trade Mark Registered.

THE GLIDDEN COMPANY • Chemical and Pigment Company Division

Baltimore, Maryland Cleveland, Ohio Collinsville, Illinois Oakland, California



DO PHENOLIC MOLDING PROBLEMS AGITATE YOU?

Choosing the right compound for a washing machine agitator can be tricky.

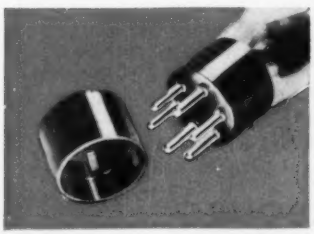
But Tech-Art Plastics Co., Long Island City, N.Y., knew that Borden engineers would be able to meet the difficult requirements of this job by adding the special properties desired to a DURITE phenolic molding compound.

The compound had to be *tough*, resistant to physical shock, alkalies and acids of soaps, detergents and chemicals . . . with *better-than-average mold release* and *fast, rigid set*, yet similar in bulk factor to simple general purpose compounds.

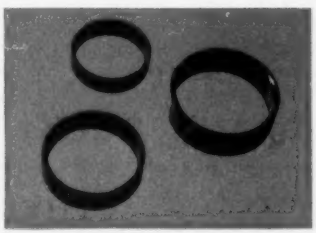
Borden's DURITE SG-720 was created to successfully accomplish this difficult task. In DURITE, Borden gives you the special properties you need, in the degree you want, by skillful combining of cellulosic, carbonaceous and mineral fillers with the resin base. Address your molding problems requiring Phenolic Molding Compounds to The Borden Company, Chemical Division, Dept. MP-61, 350 Madison Ave., New York 17, N.Y.

Borden's DURITE

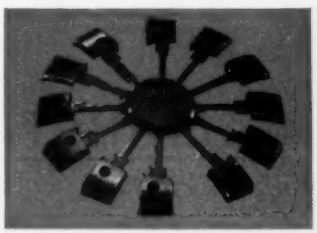
Molding Powders • Bonding Resins • Cements



Fast cure, slick finish, heat-resistance, high dielectric strength, rigid staking are special properties of Borden's DURITE HR-300...the phenolic used in this tube base.



Excellent dimensional stability, lowest friction are special properties of Borden's DURITE SG-700 . . . the phenolic used in these bushings.



Free flow with low transfer pressure, fast cure, rigid set are properties of Borden's low-pressure-type DURITE general purpose phenolic . . . used in transfer molding.

THE
TWIN-SCREW
EXTRUDER-COMPOUNDER

MAPRÉ

DETAILS FURNISHED PROMPTLY UPON REQUEST

BY

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DIEKIRCH GRAND DUCHY OF LUXEMBOURG

U. S. Agents: **AMERLUX STEEL PRODUCTS CORPORATION**
100 Park Avenue, New York 17, N. Y.



Skillful molding tells a gripping story

Among mimeograph artists, the hand is now quicker—and so is the eye, thanks to these plastic stylus handles. Their carefully developed and exactly executed non-roll design gives them a firmer grip and better balance which results in greater ease and speed for artists. The weight is ideal and durability assured through the skillful molding of the *correct* plastic material. Vivid, distinctive colors make the styli types quickly identifiable, thereby saving the artist's time.

The production of these stylus handles naturally presented their own unique engineering and molding problems. But the end results: better performance, smarter appearance, more sales appeal are typical of all Mills plastic products, created in America's finest, most modern molding plant.

One of our representatives will gladly show you how to make sure your plastic products have these important extra values. Tell us today when he may call.

Mimeograph stylus handles molded for A. B. Dick Company, Chicago



Write on your letterhead for the new Injection Molded and Extruded Plastics Catalog. Or, for detailed information about [redacted]* *piping, tubing and fittings, write for circulars containing data and illustrations.*

**Trademark registered*

ELMER E. MILLS CORPORATION

INJECTION MOLDERS and EXTRUDERS of: Tenite, Lumarith, Plastacele, Fibestos, Lucite, Nylon, Plexiglas, Polystyrene, Styron, Loalin, Vinylite, Geon, Plexene, Polyethylene, Cerex, Forticel, [redacted]*, Saran, and other Thermoplastic Materials.

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—pushing PLASTICS ahead "Under Fire"...

Under the urgency of production for defense, molded plastics can be expected to perform in hitherto unsuspected ways. Plastics may be called upon to replace scarce materials...or to improve performance characteristics of newly developed products.

Such novel applications call for more than materials and machinery. A spirit of enterprise is needed to extend the use of plastics into unexplored fields. At **MPc** this pioneering spirit is supported by the most advanced equipment for mold making, molding and finishing. Submit your plastics product or problem to Molded Products Corporation, 4535 W. Harrison St., Chicago 24, Illinois.

PLASTICS DIVISION
MOLDED MPc PRODUCTS
CORPORATION

...Pace-Makers in Plastics Molding

FREE "Data Book of MPc Facilities" An engineering-eye view of MPc press capacities and other production facilities...together with a survey of MPc special skills available for your use. *Write for your copy.*





COLOR

DURABILITY

TOUGHNESS

LIGHTWEIGHT

STYLE

AN OPEN-AND-SHUT CASE OF *Good Design*

No matter how you look at it, the Lady Betty Lunch-N-Bag, designed by Sundberg-Ferar, is an outstanding new use for Hercocel* A. Open, this smart new accessory reveals itself to be a well-integrated combination of purse and lunch box (fitted with standard vacuum bottle). Shut, and slung over milady's arm or shoulder, it's a handsome, high-styled handbag with a rich brown finish in gleaming plastic. Both inside and out, it's built for long-time service and satisfaction. Little wonder the current demand for this attractive new product far outstrips supplies!

Lunch-N-Bag is another example of the way Hercules materials and facilities contribute to the development and production of new and better things made of plastics. Our design and technical staffs invite your inquiries on "Hercocel" A or other Hercules Cellulosic Plastics.

HERCULES POWDER COMPANY Cellulose Products Dept., 916 Market St., Wilmington, Del.



Please address inquiries about the new Lunch-N-Bag to the manufacturer—Landers, Frary & Clark, New Britain, Conn.

HERCULES Cellulosic Plastics

*TRADEMARK

Molded by Wolverine Plastics, Inc., Milan, Michigan, with "Hercocel" A (cellulose acetate molding powder).

CP51-5

IDDON BROS. LTD.

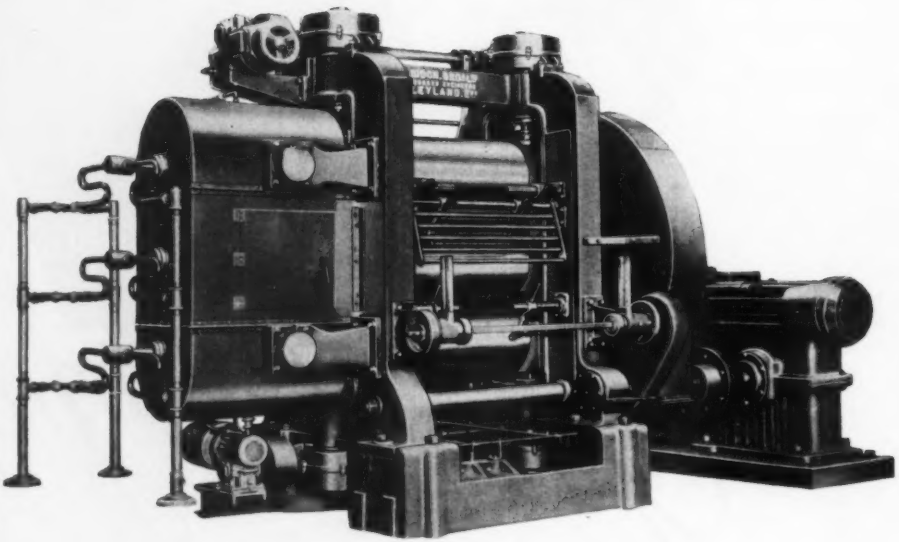
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LEYLAND-81258/9

LEYLAND, ENGLAND

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MAKERS OF

MACHINES FOR THE PLASTICS INDUSTRY



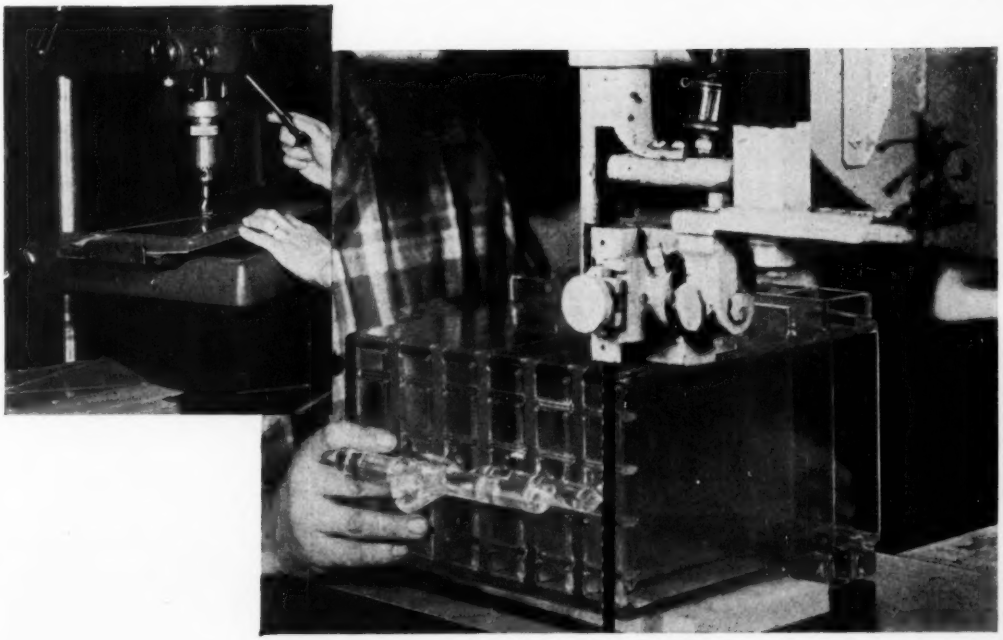
Heavy Duty 3-Roll Calender with even and friction speeds and Electrically Operated Roll Adjusting Gear. Rolls 20" x 40" face.

OVER 60 YEARS EXPERIENCE

IN THE DESIGN AND MANUFACTURE OF

CALENDERS — MILLS — PRESSES — EXTRUDERS — Etc.

ENABLES US TO OFFER A RANGE OF MACHINES WITH A SALES RECORD BUILT ON COMPARISON



Precision dimensions...engineered by:

machining and finishing Lustrex styrene plastic

An added step in the finishing operation of a molded styrene article will often greatly increase the utility of the finished product . . . as well as enhance its appearance. Only then are the ultimate properties and possibilities of the material fully realized.

Lustrex styrene plastic is readily adaptable to all the normal finishing operations—milling, drilling, threading, tapping, sawing, grooving and recessing. Bar or sheet stock may also be machined when the cost per piece of the finished article does not permit expensive die costs. Ordinary equipment for machining metal and wood is adequate provided certain fundamental procedures are followed allowing for the differences in the characteristics of the material.

Monsanto has collected a lot of useful information on machining and finishing Lustrex styrene plastic . . . available in a Production Information Bulletin which is yours for the asking. Write today for your free copy of "Machining and Finishing Monsanto's Lustrex Styrene Plastic" . . . and for information on the big Monsanto family of plastics. Please use the coupon.

Lustrex: Reg. U. S. Pat. Off.

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Serving Industry
. . . Which Serves Mankind

MONSANTO CHEMICAL COMPANY, Plastics Division,
Room 2606 Springfield 2, Mass.

☐ Please send me the booklet, "Machining and Finishing Monsanto's Lustrex Styrene Plastic."

☐ Please send me information about Monsanto's family of plastics.

Name & Title _____

Company _____

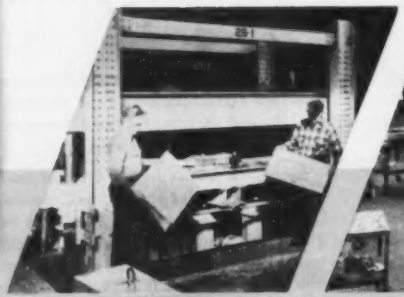
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See General American for plastics facilities unmatched...anywhere!

Make General American your complete molding source for *defense* and *civilian* production. Use most modern production-line equipment available . . . *facilities unmatched* anywhere in scope and versatility. Take advantage of skilled personnel . . . engineers, die-makers, set-up men. Ask to see samples of General American's experience with hundreds of different plastics applications . . . which have speeded production and bettered products in many industries. Write us about *your* problem . . . we'd like to help you.

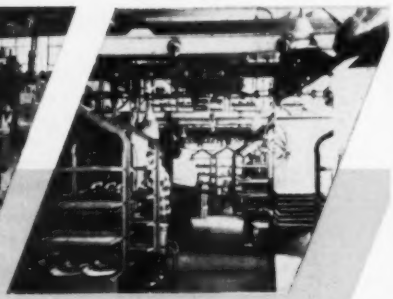
PLASTICS DIVISION GENERAL AMERICAN TRADE MARK



LOW PRESSURE MOLDING
48" x 144" low pressure molding of reinforced plastics . . . supplemented by smaller presses.



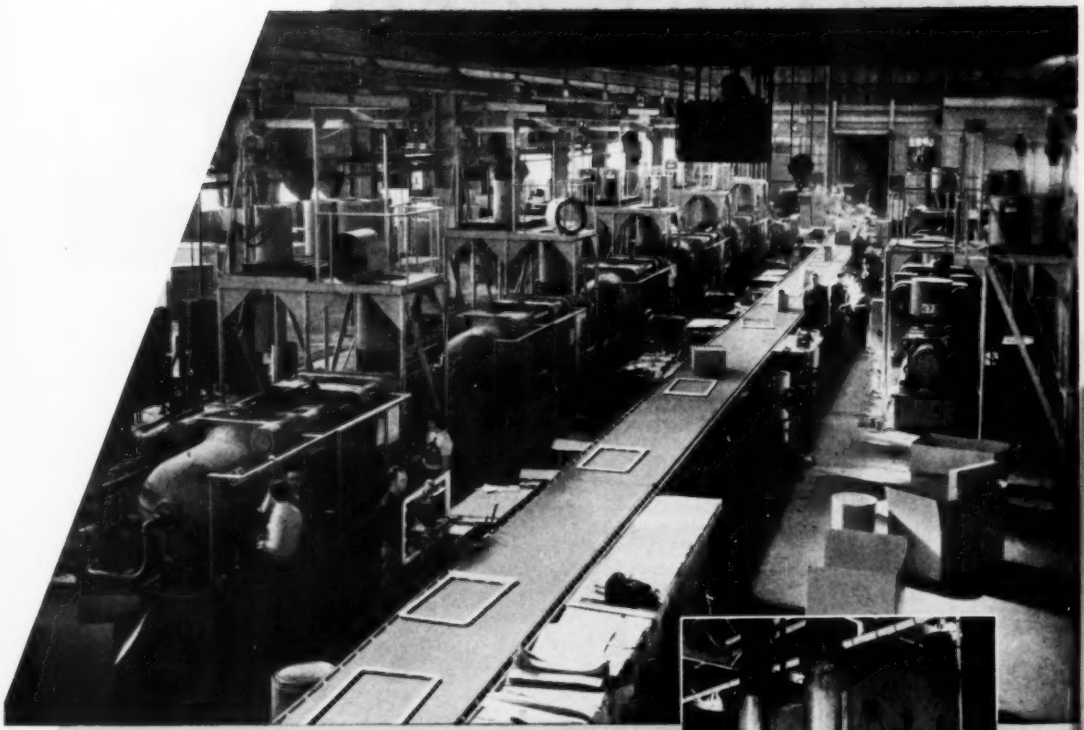
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General American maintains one of the most extensively equipped and modern shops in the country. Completely mechanized.



IN ADDITION . . .
General American offers high speed Logoquant-treating and painting . . . plus a complete assembly and packing service.

MORE MEN AND MACHINES TO PRODUCE YOUR PRODUCTS BETTER

PLASTICS DIVISION • GENERAL AMERICAN TRANSPORTATION CORPORATION

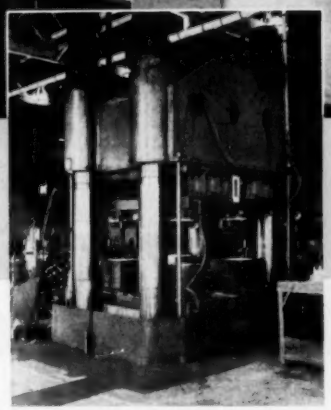


HIGH-SPEED INJECTION MOLDING

Injection equipment at General American includes largest machines ever built.

An overhead crane supplies material. Continuous conveyors carry away finished products.

1—2 oz. machine	(either Acetate or Polystyrene)
3—8-oz. machines	5—48 oz. for Polystyrene
2—16 oz. machines	or 60 oz. for Acetate
10—22 oz. machines	2—85 oz. machines
4—32 oz. machines	(either Acetate or Polystyrene)
(either Acetate or Polystyrene)	1—300 oz. machine
4—48 oz. machines	(either Acetate or Polystyrene)



MULTI-CAVITY COMPRESSION MOLDING

up to 71" x 74" platen areas

General American compression presses have turned out some of the largest plastics pieces ever produced.

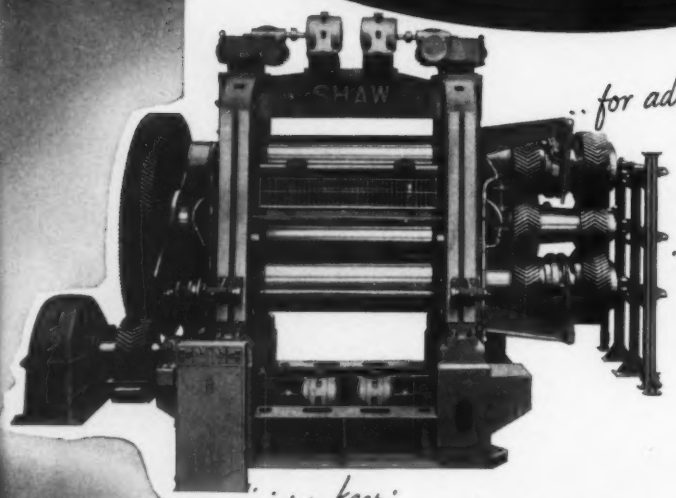
3—2000 ton presses	2—1000 ton presses
1—1400 ton press	4— 500 ton presses
1—1200 ton press	10— 350 ton presses
6—100 ton presses	

GENERAL AMERICAN TRANSPORTATION CORPORATION

135 S. La Salle Street • Chicago 90, Illinois • New York 17, 10 E. 49th Street • Detroit 2, 2842 W. Grand Blvd.

Tops in CALENDERS

BRITISH MADE



.. for advanced precision design

.. for accurate workmanship of every part

.... keeping going without stopping for maintenance

SHAW

All the latest technical improvements which have been incorporated in SHAW Calenders ensure the highest precision and uniformity in the finished plastic sheeting, cutting losses due to inaccurate gage, etc. For high temperature work the roll bearings are flood lubricated. The roll adjusting screws are individually motor driven. Hydraulic jacks are fitted to maintain constant pressure on the top roll bearings. The whole calender operation is by push-button control. Similar features are incorporated in our four-roll calenders.

FRANCIS SHAW & COMPANY LIMITED
MANCHESTER 11 · ENGLAND

R212

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cellulose acetate
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ethyl cellulose
cellulose acetate butyrate

Rigid Vinyl Sheeting

Molding Powder

cellulose acetate
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For People On The Go

products in Plaxpak bottles are the answer to better living out of a suitcase. Almost as light as a puff of smoke, Plaxpak bottles help take the "lug" out of luggage. Unbreakable—they bounce but don't break—these amazing bottles are immune to the accidents and abuses of travel. They can be thrown or squashed into bags without fear or favor. No wonder products in Plaxpak bottles are applauded—and bought—by an ever growing number of travelers.

Only the best is

OTHER EMHART PRODUCTS INCLUDE:



AUTOMATIC PACKAGING EQUIPMENT
STANDARD-KNAPP
Division of Emhart Mfg. Co.
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HIGH SPEED AUTOMATIC PRESSES
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PREMIUM QUALITY STAMPING PRESSES
THE V & O PRESS CO.
Division of Emhart Mfg. Co.
HUDSON, NEW YORK



For Beautiful Hair Breck supplies three famous shampoos in Plaxpak bottles with a diamond point finish. Users like the bottle because it won't break; neither will it chip nor mar porcelain surfaces.



For Beautiful Hands girls find it wonderfully easy to apply World of Beauty Hand Lotion by Max Factor Hollywood. A squeeze of the Plaxpak bottle provides a controlled amount of lotion.



For After-Shave Comfort

men like the clean, masculine scent of Chessmen After Shave Powder. They also like the easy dispensing provided by the handsome, unbreakable Plaxpak bottle.



For New Economies in display packaging, Paris Box Co. is making transparent set-up boxes of Plax Polyflex*. Corners are formed without adhesives or heat-sealing. High strength of Polyflex* permits use of light gauges.

good enough

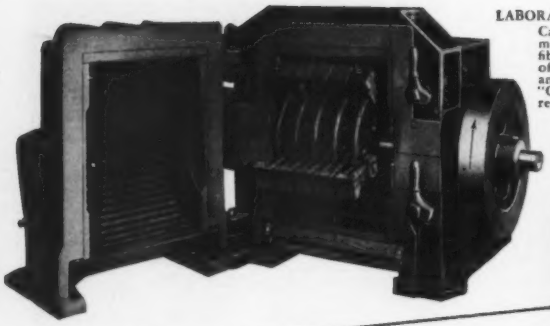
HELPFUL PLAX LITERATURE
Catalogs on Plaxpak bottles and other Plax products are available on request. Also available is a booklet "Fabrication of Polystyrene."



PLAX
FOR PLASTICS
NOT SUBSTITUTES ... IMPROVEMENTS

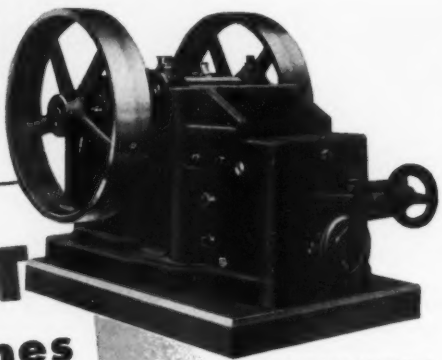
PLAX CORPORATION
Subsidiary of Emhart Mfg. Co.
P. O. BOX 1019, HARTFORD 1, CONN.
In Canada, Plax Canada, Ltd., Toronto
Sales Offices: New York City, Syracuse, Philadelphia, Cincinnati and Chicago.

Plax blow-molded products are made under the following U. S. Pats.: 2128239, 2175053, 2175054, 2230190, 2260750, 2283751, 2349176, 2349177, 2349178, 2230188. *Reg. U. S. Pat. Off.



LABORATORY SWING-SLEDGE MILLS

Capable of reducing soft, moderately hard and tough or fibrous materials to any degree of fineness between 1 in. and 20 mesh. The patented "Open-Door" feature permits ready accessibility for cleaning.



STURTEVANT

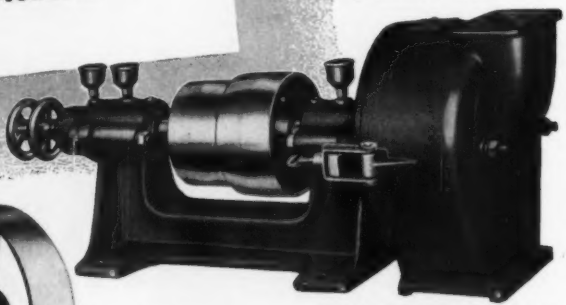
Laboratory Machines

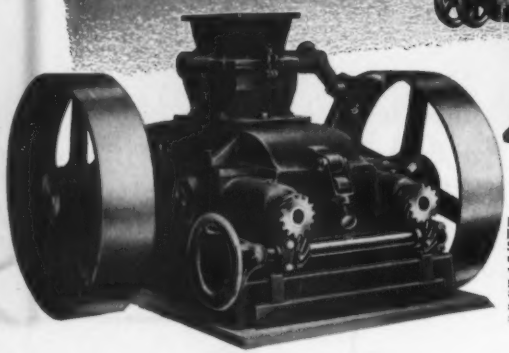
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Fast - Economical - Accurate

LABORATORY JAW CRUSHERS

Special Roll Jaw action simplifies close regulation of the product with capacities varying from 300 or 400 lbs. per hour at finest settings, to 1000 or 2000 lbs. when opened for coarser work. Each part of the crusher is accessible for quick and easy cleaning.





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First designed especially for laboratory sampling work, Sturtevant Crushing Rolls are used regularly in many plants where there are limited outputs. Range of output for the 8 x 5 size is from ½ in. to 20 mesh — and for the 12 x 12 size from ¾ in. to 20 mesh.

LABORATORY SAMPLE GRINDER

Laboratory Sample Grinders are of the "Open-Door" disc type and are capable of very fine work, producing products as fine as 100 mesh (coarser if desired) when working on dry, friable, soft or moderately hard materials. Simply turn hand wheel to provide product regulation from 10 to 100 mesh.

The only sure way to maintain strict quality of products is laboratory control . . . and that calls for accurate sampling.

Sturtevant Laboratory Equipment meets the exacting requirements of laboratory work. They are fast and accurate . . . provide true samples.

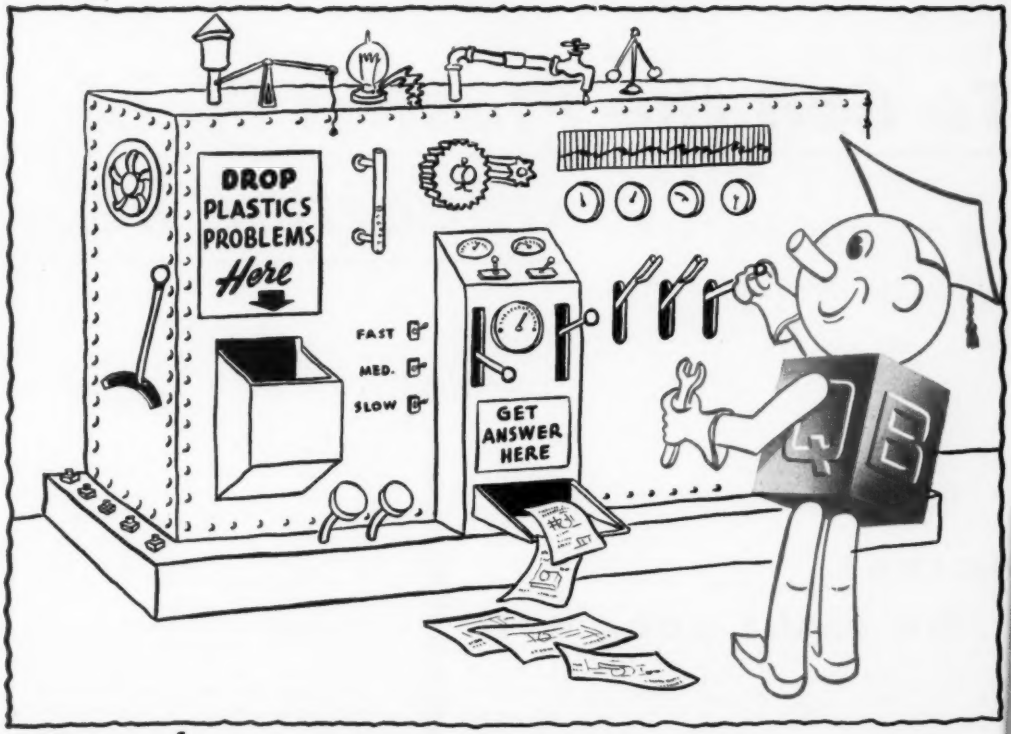
Rugged and dependable, Sturtevant equipment actually has all the features of full size machines plus extra accuracy and wider range of adjustment. The "Open-Door" accessibility permits quick, thorough cleaning . . . prevents the possibility of previous batches from contaminating new samples.

Investigate Sturtevant equipment for your laboratory. It will cut your sampling costs . . . help maintain strict quality of products . . . increase sales. Write for complete details and catalog.

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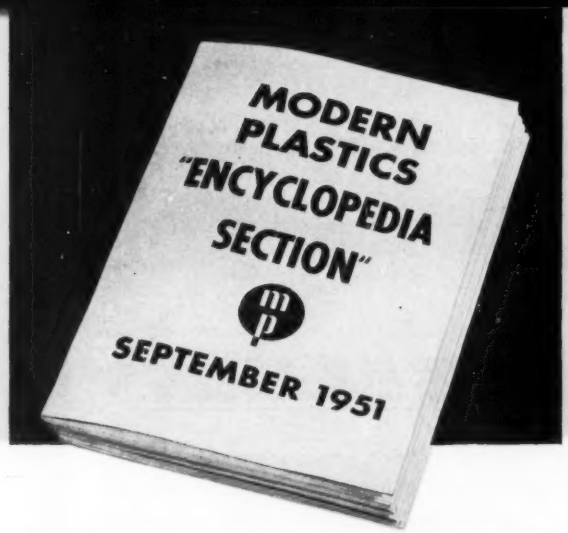
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...it's built to tell industry what it needs to know about plastics in a mobilization economy

work. . . . Issued as a separately bound supplement of the September number of MODERN PLASTICS, the "ENCYCLOPEDIA SECTION" will be boxed and mailed with the magazine to its full audience of 18,000 readers. In addition, a guaranteed minimum of 5,000 extra copies will be sold to a selected roster of executives in industry who are now urgently in need of authoritative data about plastics.

The combined circulation of both groups will therefore far exceed that of previous Encyclopedias or issues of MODERN PLASTICS Magazine.

Included in the added circulation of the "ENCYCLOPEDIA SECTION" will be the top government officials in charge of material procurement for the Armed Services. These men, with a constantly increasing measure of high volume purchasing power, will find the "ENCYCLOPEDIA SECTION" of unique value in assisting them to select suppliers for defense requirements.

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plications, the special equipment used to process them, basic data on design and production, available sources of supply.

The ENCYCLOPEDIA SECTION is designed to provide exactly this kind of information in concise, clearly understandable form—and at just the time when these answers are most urgently needed.

The ENCYCLOPEDIA SECTION is also designed to help manufacturers in the plastics industry who are seeking government defense work. It will give them a broad picture of the types of plastics applications that will be most urgently demanded by the Armed Forces, together with special lists of government officials responsible for plastics procurement and project development.

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bids and obtaining advance notice of government needs.

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3. MACHINERY

Design engineers, production engineers and plant superintendents will have a special stake in these complete roundups of recent developments in production techniques and notable improvements in the design of equipment and machinery used for processing plastics.

4. PLASTICS MATERIALS

Right down the line, this section will round up all the recent developments in the field. Special emphasis will go to three increasingly important material categories: film and sheeting, reinforced plastics, industrial laminates.

5. PLASTICS CHARTS

Fully revised, these exclusive charts depict all the basic chemical and physical properties of available synthetic materials. Through the years, the charts have come to be universally recognized as the standard guide to plastics for engineers, designers and technicians in every branch of American industry.

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Completely up-to-date, the Directory will cover every phase of plastics procurement: materials, machinery, supplies, equipment, special services (molding, extruding, fabricating, laminating, finishing, decorating, assembling and designing).

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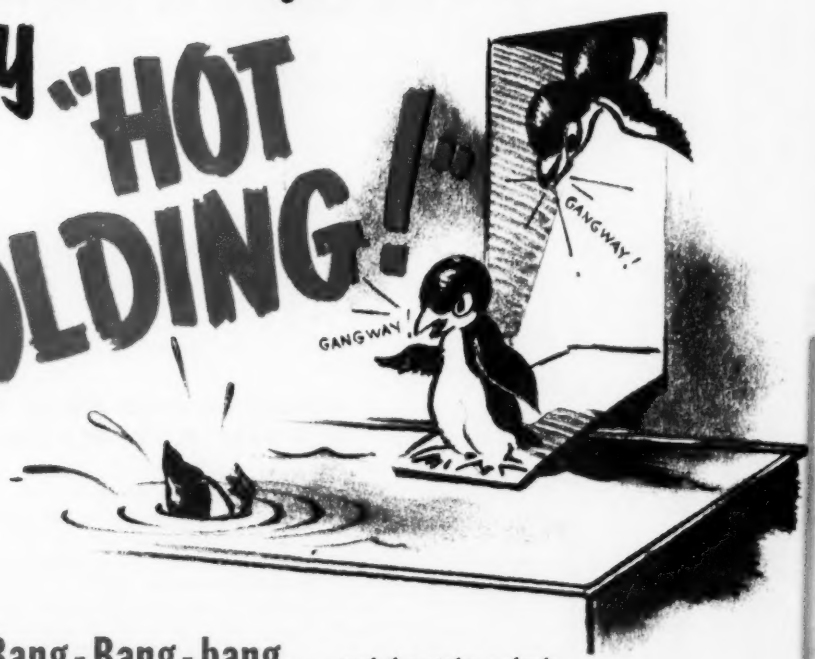
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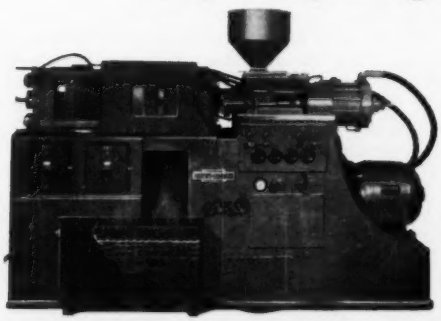
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The new GROMMETER gives you a sturdy, inexpensive plastic reinforcement. It makes grommets or buttonholes in any desired size on a production basis. Permits you to disregard present serious metal shortages . . . but results are so good that the THERMATRON GROMMETER is here to stay even when there is no supply problem!

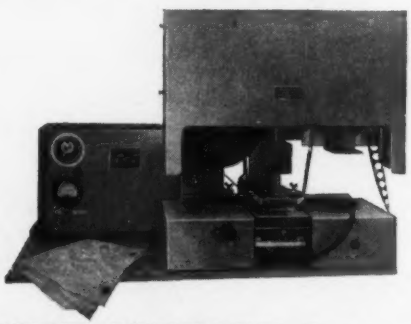
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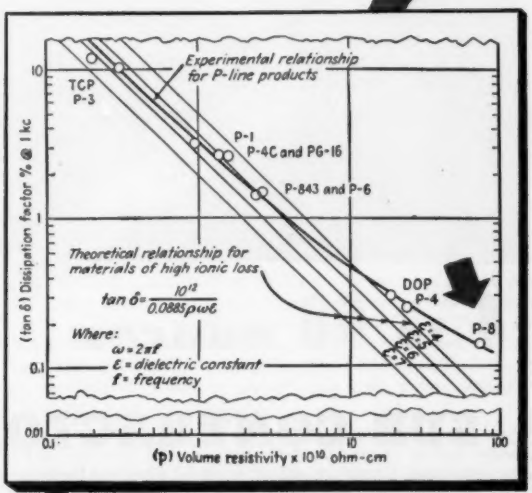
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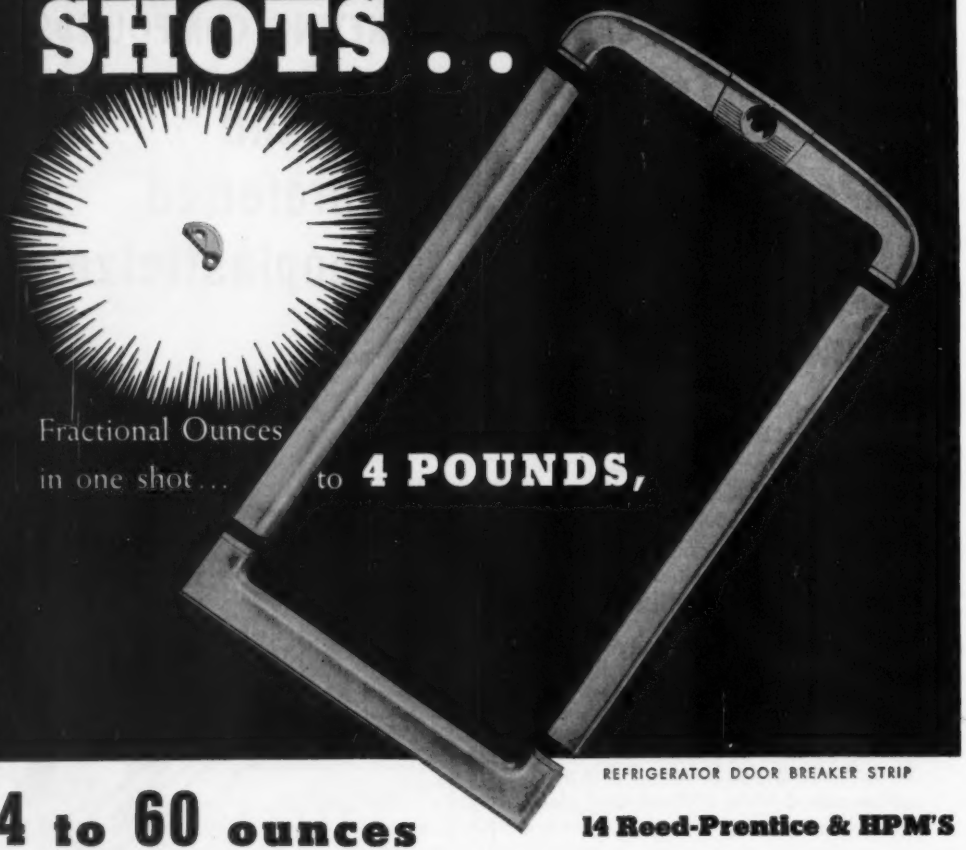
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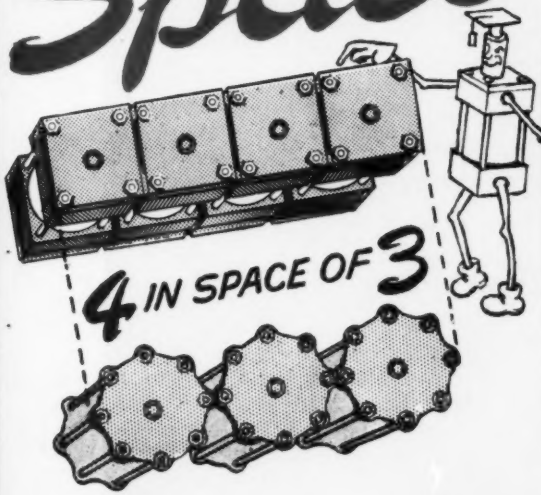
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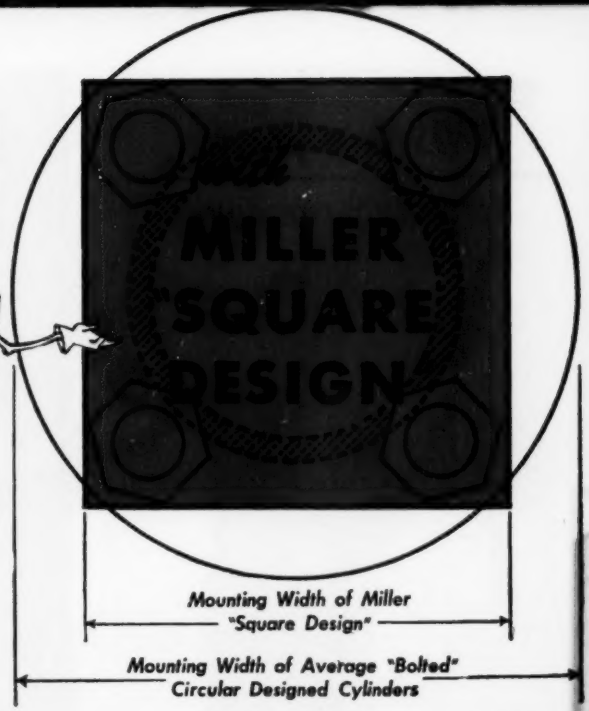
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The SQUARE DESIGN of Miller Cylinders saves up to 25% of mounting space, permitting more cylinder power in the same space and easier, more convenient installation in "tight spots." Thus, in many cases, machines and equipment can be designed more compact and less costly by using Miller Cylinders. Hours of drafting time can be saved — as only a few straight lines show any view on drawings.

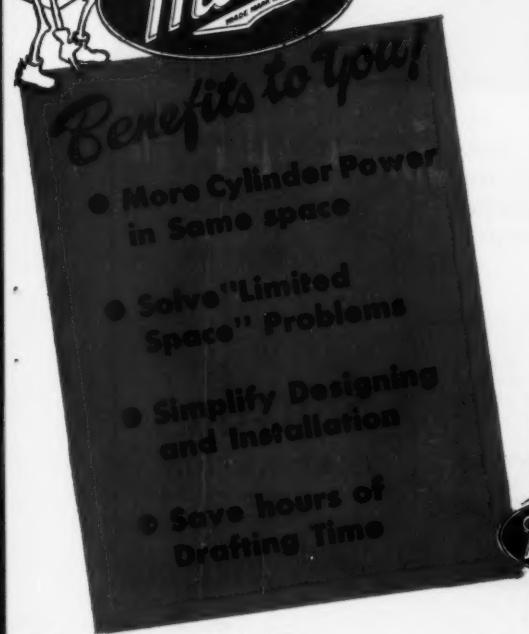
The illustration at upper left shows graphically how *four* Miller Cylinders can be mounted, bore for bore, in the same space required for *three* average "bolted" circular designed cylinders. Some Miller bore sizes permit even greater space-savings.

Other important *standard* features of all Miller Cylinders include: solid steel heads, caps and mountings, hard chrome plated piston rods, dirt wiper seals, and other "quality" features as shown in illustrated bulletins sent FREE on request. Remember, too, that Miller Hydraulic Cylinders (2000-3000 psi) meet the J. I. C. Hydraulic Standards.

Write for illustrated cylinder bulletins A-105 and H-104

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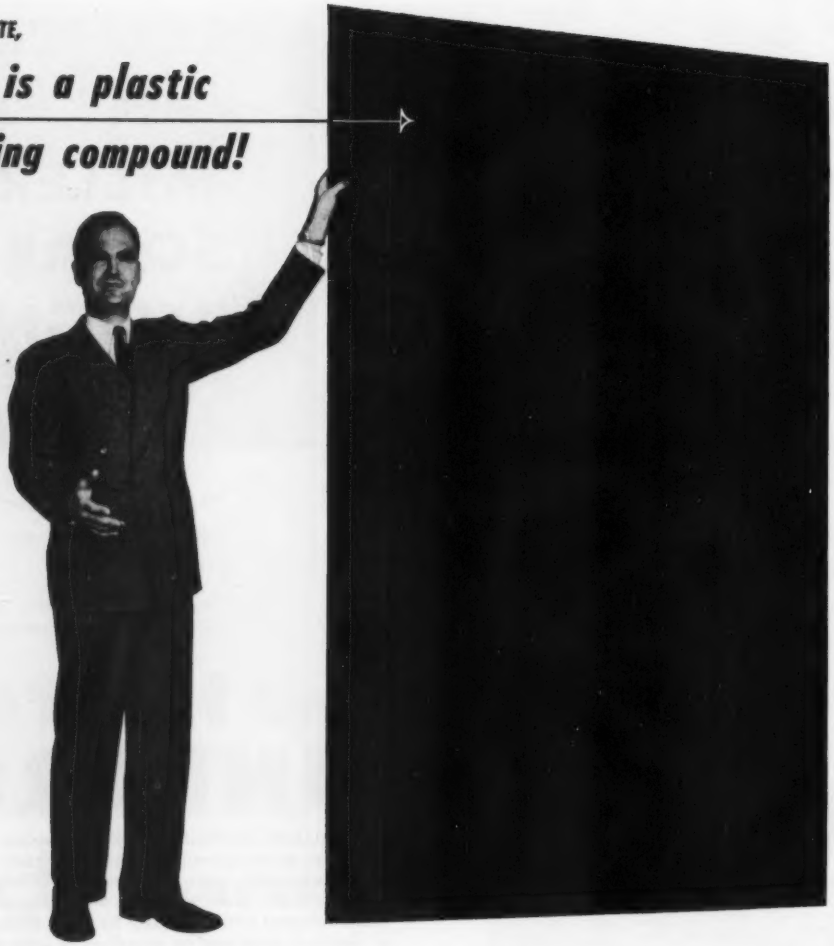
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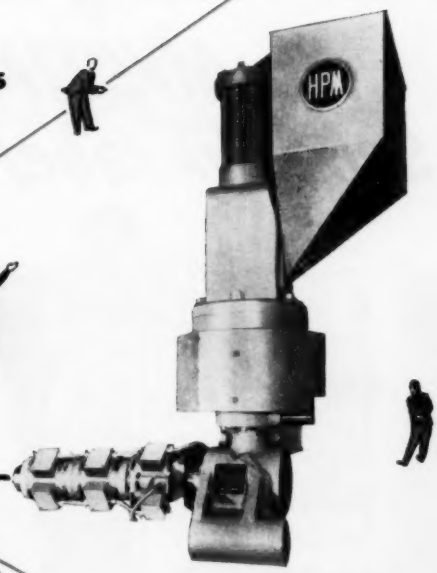
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AN ENTERTAINING BOOKLET **— "Here's Rogers and its Fiberloys" will help you decide whether you have a place for the FIBERLOYS. Please write for it, to Dept. P, Rogers Corporation, Manchester, Connecticut.**

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Pre-Plasticizing



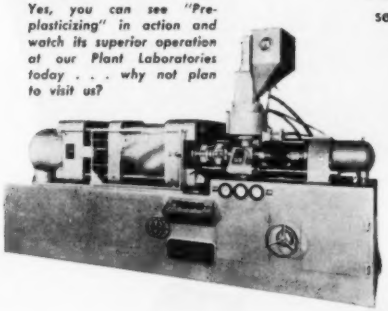
An H-P-M Development now available in standard sizes up to 200 ounces

● There's no question about it—H-P-M Pre-plasticizing is the hottest news since injection molding was developed! It greatly reduces cycle time and triples shot capacity of conventional machines. Imagine molding a 10½ oz. polystyrene silverware tray in 19 seconds with a 9 oz. machine! Formerly this part required 28 seconds on a conventional 16 oz. . . . and that's not the entire story . . . this molder saved $9,600 worth of material per year on this job because H-P-M Pre-plasticizing permitted molding to closer tolerances than is possible on conventional machines.

If you operate injection molding machines you cannot afford to overlook H-P-M Pre-plasticizing. It is your guarantee to future profits! For older H-P-M 9&16 oz. machines, a packaged pre-plasticizing conversion unit is available. Write for details.

See it in action

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Color problems



IN POLYSTYRENE

and what to do about them

Limited supplies of important elements have created color problems in translucent and opaque Polystyrenes for manufacturers and molders alike.

Certain pigments have made possible Polystyrenes with colors that have excellent stability to heat and light. These pigments produce a wide range of colors in the red-to-yellow spectrum, as well as some greens and even a few blues. Now, by government orders, supplies of these pigments are limited, except for the most vital defense uses.

There is a further problem, other pigments used as opacifiers in all translucent and opaque Polystyrenes except black, are in exceedingly short supply.

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When you use these new color formulations consider the application carefully in terms of necessary heat and light stability. For your protection, when replacement color formulations become necessary, recommendations concerning their use will be supplied.

As always, Koppers will work closely with customers to help them obtain best results. Before planning production, check with us.

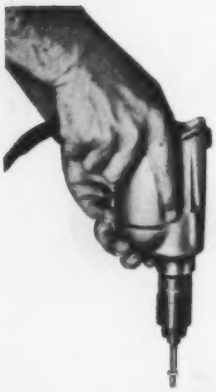
KOPPERS

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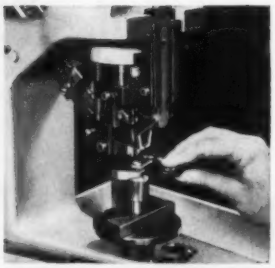
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How to add more speed to the faster fastening method



This is an automatic, single spindle, hopper-fed machine (one of several types) for high speed driving of P-K Screws, with slotted, Phillips, or hex heads. It also can be supplied with two or more spindles for multiple operations.

AUTOMATIC DRIVING

of P-K Self-tapping Screws



This automatic, double spindle, hopper-fed machine is being used for driving two P-K Type U Hardened Metallic Drive Screws simultaneously in a plastic wiring device.

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Fitting right into this urgent need for *more speed, more efficiency*—in assembly operations—is the ever-wider use of Automatic Driving devices with P-K Screws.

A wide range of Automatic Driving equipment is available for use with the various types of P-K fasteners—and with slotted, Phillips recessed, and hex head styles. It runs from portable electric drivers, through connected air and cable types, to hopper-fed automatic screw-driving machines. And all have this in common—a substantial reduction in assembly time and cost.

Parker-Kalon does not manufacture power-driving equipment, but has tested many devices in the P-K laboratory under production line conditions, and found them suitable for use with P-K Screws. Some are illustrated here.

For special information on power-driving equipment, talk to a P-K Assembly Engineer. Or, write to Parker-Kalon Corporation, 200 Varick St., New York 14.

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PARKER-KALON® SELF-TAPPING SCREWS

A TYPE AND SIZE FOR EVERY METAL AND PLASTIC ASSEMBLY



Farrel-Birmingham engineers will be glad to help you select individual machines or combination units best suited for your specific requirements.

The processing setup shown in the blueprint was developed some time ago by Farrel-Birmingham engineers, working with plastics manufacturers, to synchronize the progressive steps in the production of plastic film and coatings.

Since then, many installations of these *Matched Production Units* have been made in plastics plants. In fact, the combination has given such satisfactory service that it has become the generally accepted unit for this type of production.

The unit shown consists of a size 3A Banbury mixer, a 22″ x 60″ mill, a 28″ x 66″ four-roll, Z-type calender and the necessary auxiliary equipment. The output of the Banbury provides full-time operation without overload to the mill, assuring an even flow of properly conditioned material to the calender. The calender is in ideal balance with the other two machines. Its output speed may be adjusted according to the gauge of stock being run. Where greater or lesser output than is provided by this setup is required, larger or smaller machines with matched capacities are available.

FARREL-BIRMINGHAM CO., INC., ANSONIA, CONN.

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago, Los Angeles, Houston

Farrel-Birmingham®

FB-668

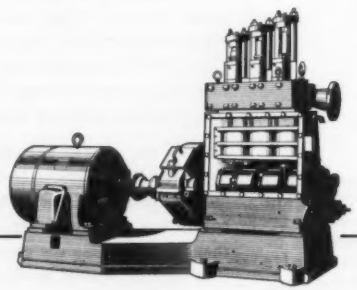


more horse-power per pound

Famous for stamina and a sure foot, the burro was a hard-working "pardner" of the old-time prospector. He's a little fellow—but he packs more horse-power per pound than any of his four-footed cousins . . .

This ability to get more work done with fewer pounds to do it is precisely what Aldrich Direct Flow Pumps have to offer. As a result of improved design, weight of the fluid-end is considerably reduced. And—whereas a speed of 150 rpm was formerly considered high for reciprocating pumps—these compact, Direct Flow units are operating today at speeds of 500 rpm for the 3″; 360 rpm for the 5″; and 300 rpm for the 6″ stroke. In each case, you get greater volume and higher pressure from a smaller pump: *you get more horse-power per pound.*

Applications for Aldrich Direct Flow Pumps include: molding, extruding and other operations requiring hydraulic pressure. . . . Aldrich designs and furnishes *complete* central hydraulic systems—incorporating Aldrich Pumps, accumulators, alleviators and control systems. Write for Data Sheets.



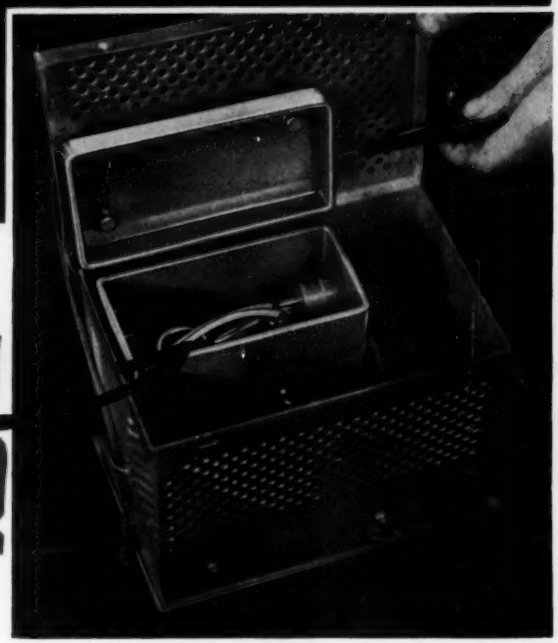
THE ALDRICH PUMP COMPANY

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...Originators of the Direct Flow Pump

Representatives: Birmingham • Bolivar, N. Y. • Boston • Buffalo • Chicago • Cincinnati • Cleveland • Denver • Detroit
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Low Cost Housing for 25,000 Volts!

●Two amplifier tubes and a transformer, putting out a walloping 25,000 volts—are contained far more safely and economically in this 7¾-inch-high housing, molded from BAKELITE Low-Loss Phenolic Plastics BM-17748*. The power unit was originally designed by North American Philips Co., Inc., as part of the Norelco Protelgram projection television system, and is now being adapted to military applications where space, weight and efficiency are major design requirements.

Originally these high-voltage drivers were vacuum impregnated, oil-filled, and hermetically sealed in metal cans. Today, with the use of BAKELITE Low-Loss Phenolic Plastics, neither oil impregnation of high-voltage components nor vacuum sealing is required, because of the superior dielectric qualities of the material. Tube replacement and other services are easily handled in the field. Flammability worries are greatly reduced. Production is speeded up and simplified. Costs are pared to the bone.

BM-17748 is one of a group of BAKELITE Low-Loss Phenolic Plastics specially formulated for high-frequency electrical insulation wherever low power factor, low loss factor, high resistivity, dimensional stability, and low water absorption are required. It is available for such exacting services as capacitor casings and frames, condensers, and coil forms. It is recommended to molders and manufacturers desiring approval under MIL-P-14A.

Bakelite's engineers will be glad to consult with you, and provide detailed data on electrical, mechanical, and other properties of low-loss phenolics. Write Dept. BX-13.

*Molded by Chicago Molded Plastics Corporation

BAKELITE
TRADE-MARK
Phenolic PLASTICS

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No bounds limit Columbia's search for the successful solution to your problems in plastics.

Columbia

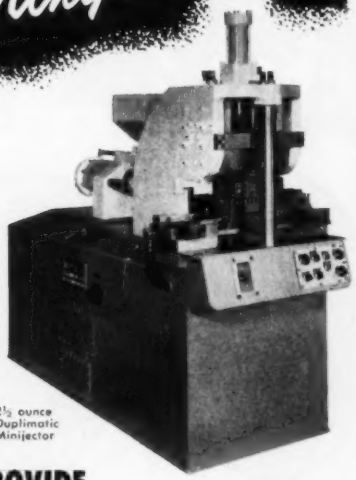
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2½ ounce Duplimatic Minijector

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There's nothing like a Moslo Minijector molding machine for increasing production and decreasing molding costs. A Moslo Minijector is designed and built to provide years of satisfactory service, outstanding performance and operating economy. Invest for the future—Investigate a Moslo Minijector.

The Complete Minijector Line Includes

The Moslo ¾ ounce hydraulic or hand operated Minijector
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Compare our Specification Guaranteed Production Ratings

1. Stainless steel, torpedoless cylinder
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Colorblende AND *Dispersa*

The Newest Names In Dry Colorants

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Immediate Delivery
We invite your inquiry — Order Today!

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CHARGE

. . . but with what ?

There is, of course, no more critical question. For on the character of the charge depends the character of the finished product—and many vital considerations such as production costs, mold life, percentage of rejects . . . the very factors which determine whether you produce at a profit or not.

Therefore you cannot over-emphasize the importance of obtaining the most suitable, and economical, molding compounds for the jobs you handle.

That's where Metasap* Stearates can be of particular assistance. The Calcium, Zinc and other Stearates which we manufacture for use in molding plastics have proved conclusively that they promote significant manufacturing economies *all along the line* . . . and assure better products, too.

Yes, there is no question that lubricating with Metasap Stearates assures—

IMPROVED PREFORMS

IMPROVED FINISHED PRODUCTS

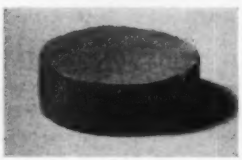
INCREASED OUTPUT at LESS COST







This picture shows a preform typical of a great number test-molded from compounds that did NOT contain a Metasap Stearate as lubricant. Such preforms required an average of 50 pounds pressure to eject them from the mold, and a large percentage were delaminated in the process.



And here's a picture that shows a typical preform obtained, during the same tests, from molding compounds containing Metasap Calcium Stearate. Perfect in shape, such preforms required only 10 pounds of pressure to release them from the mold.

Today, when in the face of shortages you must make every ounce of molding compound *count*, you'll find no more effective aid to profitable compression molding than Metasap stearate lubrication.

*REG. U. S. PAT. OFF.

METASAP CHEMICAL COMPANY

For complete information, write

METASAP CHEMICAL COMPANY, HARRISON, N. J.

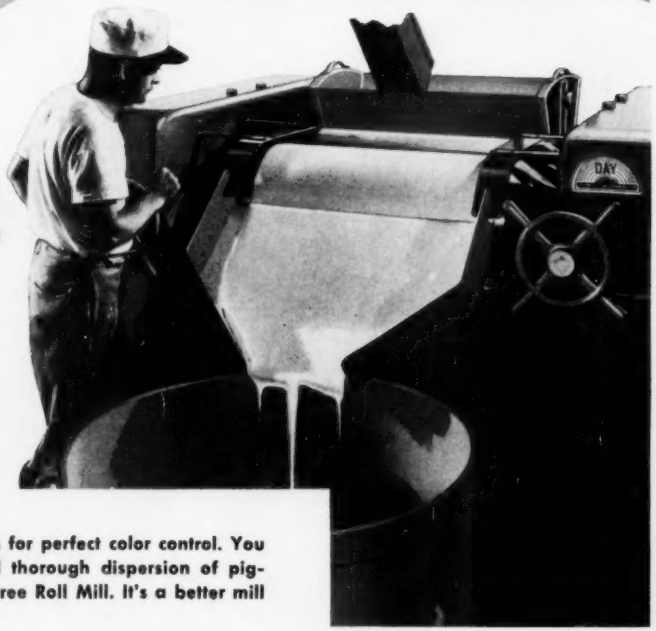
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Get Positive Color Control in PLASTICS

DAY THREE ROLL MILL



THREE SIZES:
14" x 30" 10" x 22"
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Production of vinyl chlorides calls for perfect color control. You can insure uniform grinding and thorough dispersion of pigments with the DAY Type "B" Three Roll Mill. It's a better mill for

5 BIG REASONS:

1. **High grade electric furnace chilled rolls. Chamber-bored thin wall construction guarantees uniform cooling and eliminates uneven expansion to assure uniform grinding. Independent screw-type adjustments provided for front and rear rolls. Adapter for thin detachable scraper blades.**
2. **Solid one-piece cast iron frame, ribbed for maximum rigidity.**
3. **Heavy SKF self-aligning roller type bearings for long, trouble-free service.**
4. **Helical cut gears for smooth, quiet operation; totally enclosed within mill frame.**
5. **Heavy silent chain type drive, fully lubricated. All gears run in oil. Shear pins protect the rolls from damage at all times. Driving motor mounted under rolls, inside frame.**

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PORTRAIT OF A BRITISH TOOL-MAKER

Never mind the machine (for the moment). Concentrate on the man who's operating it. He's only 38, but that means twenty-four years' continuous experience in British plastics engineering. He's good.

Like him to work for *you?* The machine he's handling (a Keller die-sinking machine) is just one item in a tool-shop as modern in equipment and organisation as any in the Western World. The company he works for* banks its reputation on *accuracy and know-how.* It makes tools for every kind of plastics molding, for export to many countries throughout the world.

A good steel mold is a key asset in your business, standing for an important sum of money. So long as that money's well spent, a short sea journey is neither here nor there.

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The experience of our laboratories in the development of Vinyl Plastisols has been widely recognized in the plastics molding industry. Our "know how" has solved many specific problems of application and production.

A request to the Watson-Standard technical staff will provide you with assistance in meeting your particular specifications and production methods. There is no obligation. Write today.

Send for your copy of technical paper entitled "Slush Moldings." It's free!

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Speed Nut
SAVINGS STORIES

PRODUCTION RATE

5 Times as Great!

Reports TRU-VUE Company, Rock Island, Illinois

Production soared when SPEED CLIPS® were incorporated in the redesign of film viewer. Other immediate benefits: new beauty, new sales appeal were added to product: new safety-in-use provided.

The Tru-Vue Company recently put their film viewer through a complete redesign process. Out of this came a new method of installing lenses in the eyepieces. This vital product-improving design change was effected with "custom-built" SPEED CLIPS. The most important advantage was the simultaneous installation of both lenses instead of the one-at-a-time method previously used. Under actual assembly line conditions *this provided an increase in production from 400 units to 2,000 units per day!*

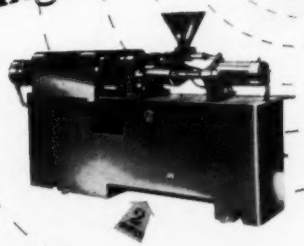
What's more, the design of the viewer was streamlined for greater eye appeal, and for more economical plastic fabrication. Also, the lenses were secure and safe—no chance for them to become dislodged or lost, as they did in the old style viewer.

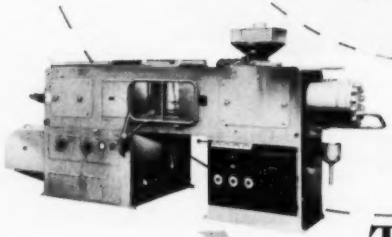
All this adds up to real savings for Tru-Vue Company. Some of the same might be in order for *your* products. Find out the easy way—through a comprehensive Tinnerman Fastening Analysis. Sales offices in principal cities are ready to serve you—or write for details. TINNERMAN PRODUCTS, INC., Dept. 12, Box 6688, Cleveland 1, Ohio. In Canada: Dominion Fasteners Limited, Hamilton. In England: Simmonds Aerocessories, Ltd., Treforest, Wales.

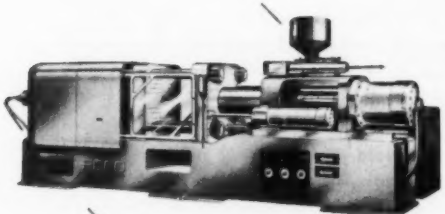


focus on injection moulding machines

PECO PROJECTILE PRODUCTS







THE attention of Plastics manufacturers may profitably be centred on PECO Injection Moulding Machines, for they are designed to give high productivity through maximum efficiency.

They are built in 2oz., 4oz., 6oz., 8oz., and 16oz. capacities. They represent the most up-to-date development of this type of plant.

Full particulars will be sent on request.

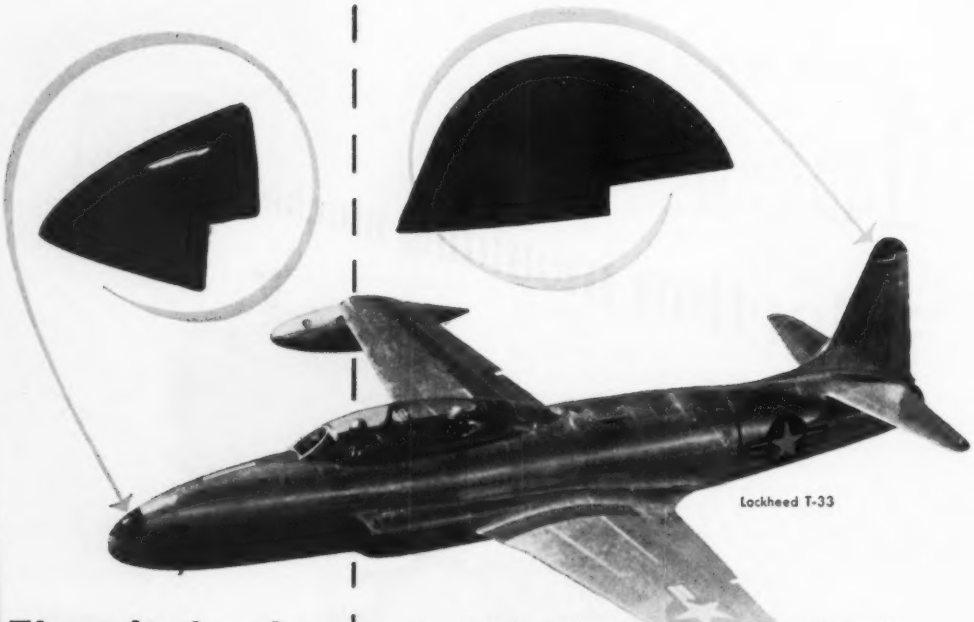
MOULDS

PECO MOULDS. Expert designers and mould makers are employed and moulds can be supplied to samples submitted, including die-sinking models if desired. An important side of the Company's work is the hobbing of cavities for moulds and medallions—the plant includes a 3,000-ton Hobbing plant. Master Hobs to customers' samples made as required.

THE PROJECTILE & ENGINEERING COMPANY LTD.

ACRE STREET, BATTERSEA, LONDON, S.W.8, ENGLAND

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Lockheed T-33

The vital role of Vitron in defense aircraft operation

Our fighting aircraft see and hear through radomes of VITRON glass-fabric laminates.

Night-probing radar brought a new requirement to the aircraft industry—a need for structural materials of tremendous strength and light weight, that would give excellent transmission of radar microwaves. And of course, this material must not warp, swell or shrink under tropical heat or subzero cold, and must be readily adaptable to the precision tolerances and exacting standards of the plastics and aircraft industries.

Only glass-reinforced plastic could fill all these requirements. Made by plastic laminators using cloth woven from VITRON Glass Yarns, radar-domes (radomes) are now widely used with locating and communicating devices.

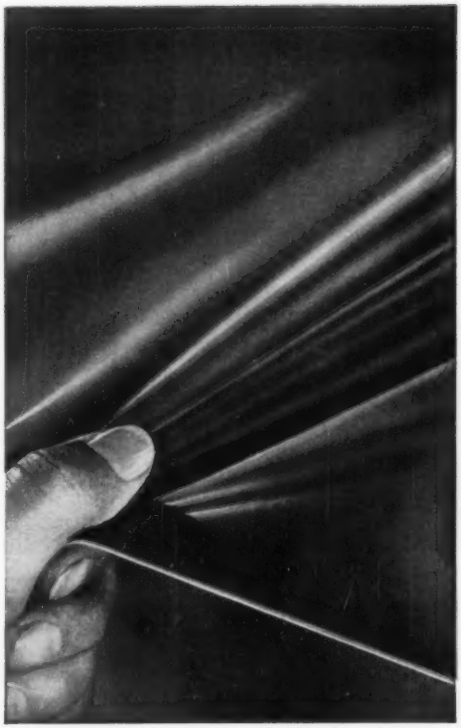
Do you have a problem in our country's preparation for defense that may be solved by the outstanding functional properties of VITRON? We will be glad to assist you, and can immediately inform you regarding glass-plastic combinations, sources of supply of intermediate products and names of leading industrial weavers of VITRON Glass Yarns.

*Radome and fin tip illustrated made by Zenith Plastics Company

Vitron

PLASTIC REINFORCING MATERIALS

GLASS FIBERS INC. 1810 Madison Avenue • Toledo 2, Ohio



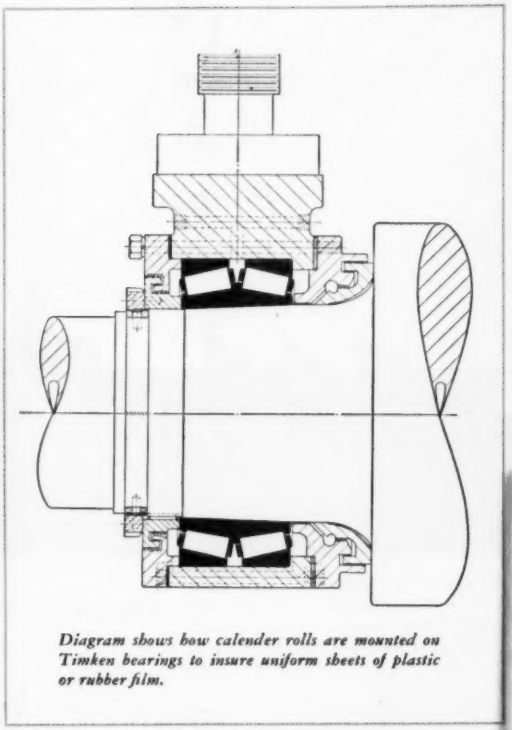


Diagram shows how calender rolls are mounted on Timken bearings to insure uniform sheets of plastic or rubber film.

Looking for consistent film gage and color?

NOW you can get precision control of plastic and rubber film gage, eliminating variation in color shades. Timken® tapered roller bearings on your calender rolls give you uniform film thickness day in and day out, cut rejects to a minimum. And because Timken bearings maintain closer gage tolerances, there is less material wasted due to too-thick film.

Timken bearings may be properly adjusted to assure free rotation, without looseness, when the calender rolls come up to operating temperature—thus compensating for roll neck expansion and maintaining accurate control of gage. Furthermore, the adjustable feature of Timken bearings permits grinding of rolls on preloaded bearings, in chocks, to get minimum eccentricity.

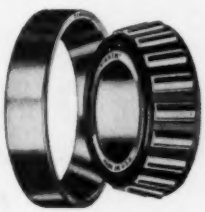
With Timken bearings on your mill equipment, you can count on (1) uniform high quality in plastic and rubber film, (2) minimum maintenance costs, (3) fewer rejects.

For full information on Timken bearing applications for calenders, mills, refiners, and mixers, write The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⬯ AND THRUST ⟷ LOADS OR ANY COMBINATION ✳

let's look at the shape of things to come!





. . . if future plans require it . . .

here's how your **customers** can cut costs and get faster handling

Your customers can lower a product's weight with *lightweight* plastics . . . and particularly with that leading plastic . . . *polystyrene!* They can conserve handling time and lower their packaging requirements by using lightweight polystyrene in their products.

Also, more time-saving features are offered because your customers can reduce assembly and finishing operations with polystyrene. One piece *larger area moldings* are now possible through rapid advances in polystyrene research, in molding techniques and machinery. These new moldings may eliminate many assembly steps. Then, too, polystyrene comes in a wide range of built-in colors . . . colors that won't chip, peel or rust. This means that your customers can keep their finishing operations to a minimum.

Dow, as a leader in the plastics industry, offers you and your customers a complete line of *quality controlled* polystyrene formulations sold under the registered trademark, Styron, plus the expert assistance of Dow's Plastics Technical Service. When looking at the shape of things to come in '51, be sure to include Styron plastics in your planning for future civilian or defense products. Write Dow today.

Plastics Division—Dept. PL-106

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Dow Chemical of Canada, Limited, Toronto, Canada

STYRON

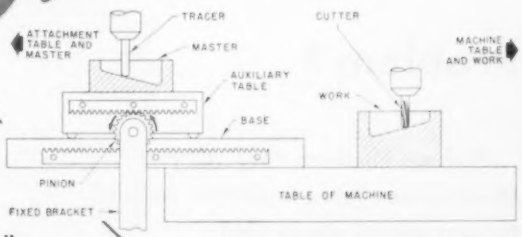
. . . a quality plastic for a quality job!

DOW plastics

and • VICE VERSA

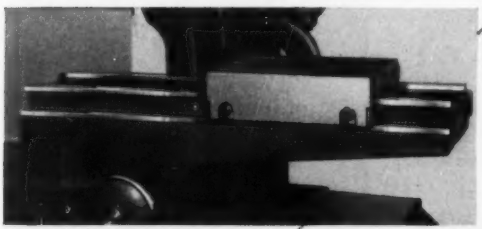
You can make left-hand molds and hobs from right-hand masters and vice versa! That's the cost-reducing advantage offered by Reverse Image Attachments for CINCINNATI Hydro-Tel Type Milling Machines. Every minute detail in the master is faithfully reproduced in the work under the cutter, but to the opposite "hand." There's a size for the 8" x 18" Tool and Die Miller, 16" Vertical Hydro-Tel and 28" Vertical Hydro-Tel. If you have these CINCINNATI Milling Machines in your shop working on hobs and molds, especially those for right- and left-hand halves of a part, it will pay you to look into the possibilities of Cincinnati Reverse Image Attachments.

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO

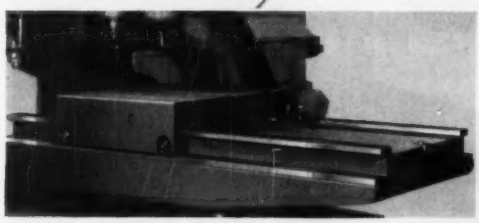


Principle of operation, Reverse Image Attachment for CINCINNATI Hydro-Tel Type Milling Machines. The drawing is a view from the rear, showing the racks and gear to advantage.

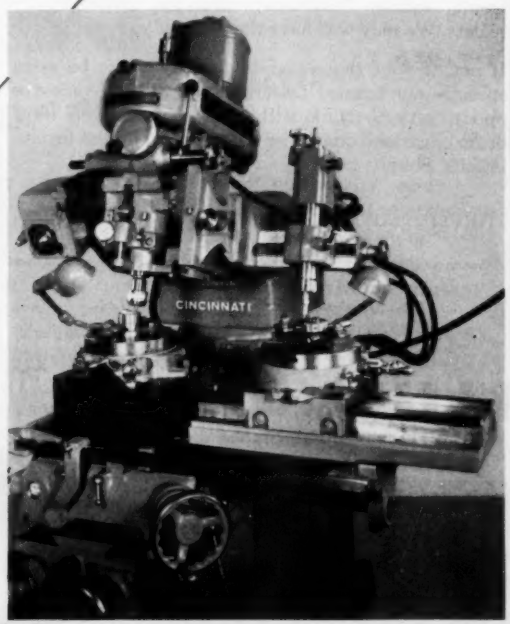
Below: Right- and left-hand hobs for plastic chessmen, milled on a CINCINNATI 8" x 18" Tool and Die Miller, equipped with a Reverse Image Attachment, and two 12" Circular Milling Attachments.



Reverse Image Attachment for CINCINNATI 16" Vertical Hydro-Tel Milling Machine.



Reverse Image Attachment for CINCINNATI 28" Vertical Hydro-Tel Milling Machine.



CINCINNATI

MILLING MACHINES • CUTTER SHARPENING MACHINES
BROACHING MACHINES • FLAME HARDENING MACHINES
OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

What's the "Rub" in your Rubber Products Problem?

...Perhaps Flintkote Research and Development have found the answer to your special needs, too!

Sometimes, in adhesives, coatings or sealers, *just a little difference makes all the difference in the world.*

And, finding that important difference may give you exactly what you are looking for in fabricating, compounding or processing. We have done just that for many manufacturers.

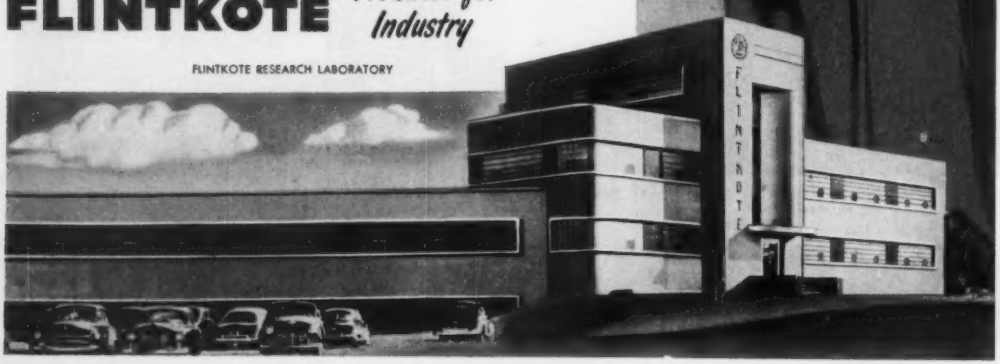
But first of all, investigate Flintkote's wide line of both aqueous and solvent types of compounds: cements, sizings, laminates, saturates, coatings and sealers. We may well have the product you need.

If not, if your requirements *do* turn out to be extra special—our trained research staff will welcome the opportunity to work with you—whether you want drum or carload quantities . . . rubber and resin formulations. Simply *write:*

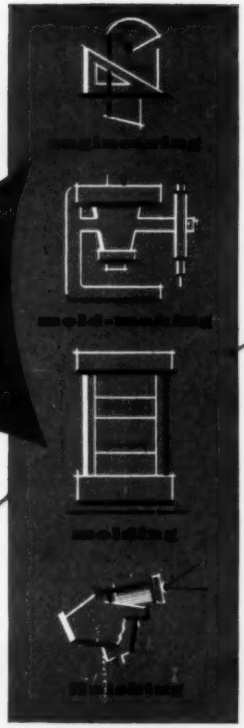
THE FLINTKOTE COMPANY, *Industrial Products Division*
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your key to greater production

NOW, more than ever before, molded plastics provide you a means to eliminate production bottlenecks . . . a way to get needed precision parts in large quantities—*fast.*

With literally scores of new materials to choose from, plastics afford practically any combination of desired physical properties. Wear-resistance . . . corrosion-resistance . . . resistance to heat and cold . . . strength and impact-resistance . . . these are but a few of the many qualities of present-day plastics, properly molded.

And General Industries—one of America's foremost plastics molders for more than 30 years—is ready *now* with both the experience and extensive facilities to help you with any problem involving the use of molded plastics.

Write *today* for a copy of General Industries' free 16-page booklet, *Your Product in Plastic.*

THE GENERAL INDUSTRIES CO. DEPARTMENT R • ELYRIA, OHIO

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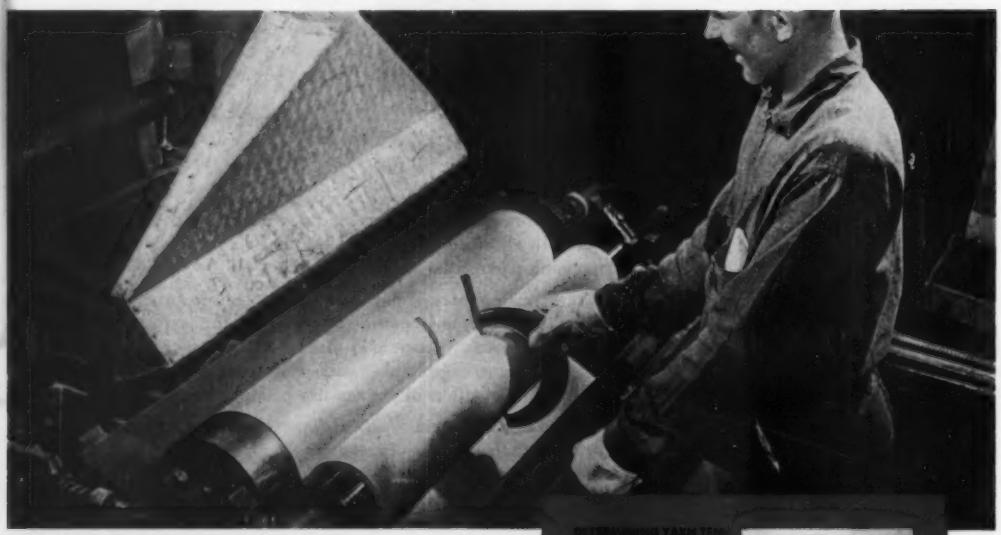
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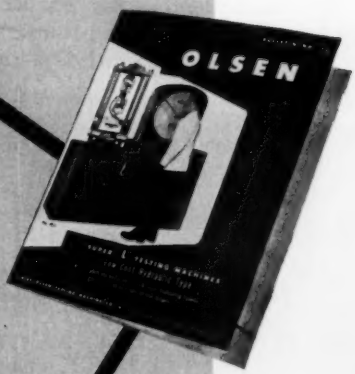
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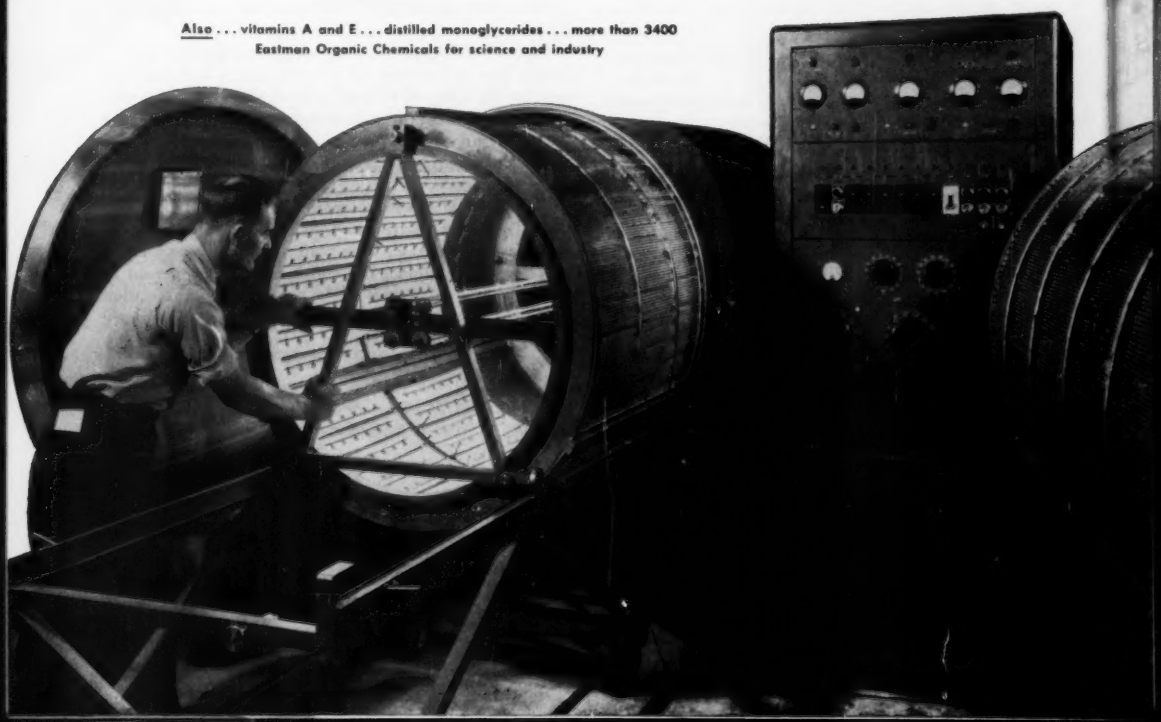
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CHARLES E. WILSON

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Modern Plastics BULLETIN

May 15, 1951

Polyethylene on Allocation

Polyethylene has finally come to that inevitable state where extreme demand and short supply has forced government allocation. Beginning June 1, this material will be allocated under government direction to military and essential civilian applications where the need is greatest.

The Armed Forces are currently consuming in the neighborhood of 40% of polyethylene production, and it is anybody's guess as to how much of what's left will go to essential civilian items. Whatever amount is left after essentialities are provided for will be left in the hands of the producers to distribute among their customers as they see fit.

The official order applying to polyethylene is Schedule 5 to M-45, May 11, 1951, which means that polyethylene is the fifth chemical to come under Chemical Allocation Order M-45—an overall order to be invoked whenever a specified chemical material is to be placed under government allocation. Under M-45 three different methods of allocation may be used. Polyethylene is subject to Appendix B method which is different from Appendix A, the method used for nylon, Teflon, and resorcinol, the other plastics now under allocation.

Processors must certify end use

Under Appendix B regulation, only the supplier of polyethylene submits a form to the government asking for permission to distribute his material to customers who will use polyethylene for specified purposes. In the "A" method, both supplier and user must submit requisitions to the government. Under the "B" method, now applicable to polyethylene, every person who purchases the material from a supplier is required to enter on, or attach to each purchase order, a *certified* statement of proposed use. Where more than one end use is listed, a separate quantity should be specified for each end use.

The system works like this: A Texas dairy, for example, wants polyethylene film for packaging dried milk. The film required is ordered from a polyethylene extruder with a certified statement of what the film is to be used for. The extruder, who furnishes film to various customers, then puts together his orders according to "baskets." That is, he places orders for dried milk packaging in one group; for frozen food packaging in another; for drum liners for chemicals in another; for tablecloths in another. The total order for raw material is forwarded by the extruder to the supplier.

The supplier then fills out Form NPA F-47 before the 20th of the month, and in column 2 of that order he specifies the amount ordered by his customers, together with the end use. If more than one end use is listed for a particular product, a separate quantity is specified for each.

Civilian items that get high priority

When these forms reach NPA, the allocations officers check off the military requirements and certain essential items for fulfillment. After military orders are provided for—and even those may not necessarily be allocated 100% if there is reason to believe the quantity is excessive or the use unessential—material is allocated for essential civilian end uses. Present essential civilian applications are primarily those needed in the transportation, communication, public health, and food production fields.

Orders for polyethylene which are not classified as for military or essential civilian use are given a rubber stamp treatment noting that they are not to be filled until all others are taken care of. The supplier may then fill them according to the amount of resin left. It is generally believed that orders for other than military and essential civilian use will be filled according to the customers' historical purchasing pattern with the supplier.

It should be obvious from the above that there will be no more DO orders or directives for polyethylene —allocation of the material into its most needed channels removes any need for DOs.

A polyethylene ghost that should be quashed at

this point is the widely prevalent idea that the government was going into the polyethylene extrusion business. This rumor no doubt arose from the large number of big extruders purchased by Uncle Sam. Those extruders are being used for extruding rocket propellant charges; they have no connection with polyethylene.

New polyethylene plant

The big question confronting many users is: How much polyethylene is there going to be for other than military and essential civilian products? It will probably be much less than half of total production, even when Bakelite's new plant comes into production in July. Production is now estimated at over 5 million lb. a month, and there are indications that civilian use alone could absorb the complete output, yet there is a constantly growing demand by the Armed Forces. The Signal Corps has reportedly scaled down its expected increased demand for next fall, but the scaled-down amount will be quickly taken up by other applications. There may possibly be a temporarily raised plateau of availability for a month or two after the new plant comes in, but don't let it fool you—the potential demand for military and essential civilian products is too high to expect relief in the form of over-all availability. Both Bakelite and Du Pont have plans for further expansion, but realization is more than a year away. The new Gulf Oil plant of Louisiana for ethylene production, to be used for Du Pont polyethylene, is thought to be at least two years away.

Polyethylene for packaging

Several items in essential civilian demand are highly important factors in this situation. Used for water drainage in mines, polyethylene pipe has proved superior to metal and carries high essentiality. Farmers want it for irrigation tubing. Wire coating and other electrical uses are high priority. But packaging is the tightest. NPA officials say that 90% of the packaging shortage complaints coming to them concern polyethylene; 5% about cellophane; 5% about Pliofilm. Most of the complaints about the latter two arise from the comparatively recent new and strong demand for self-service meat wrappers. But the polyethylene packaging demand includes closures, bottles, containers, film, and coated paper.

Dried milk producers want something like 900,000 lb. of film this year. The frozen food packers have had to be supplied by way of directives the last two months, but were limited to 100% usage of their first quarter 1950 pattern. They want more.

There will be some scurrying around in the packaging field to adjust for the most essential uses. Strangely enough, styrene may be one of the materials affected because there are now on the market thousands of styrene food containers with polyethylene covers. Government officials point out that the amount of polyethylene used in a cover will make three bags for frozen food. Therefore, bags may be recommended instead of rigid containers. That's just a hint of how authorities are thinking. Their reasoning goes back to the conservation program of World War II days when industry was bluntly told how and when to substitute one product for another.

Other Packaging Materials

As indicated above, other plastics materials used in packaging are in no particular trouble at this moment. Acetate film and sheet is almost 50% DO business, and a big project pertaining to the missile program now getting under way will take more, but increased production—as shown by government statistics—is helping take care of big civilian demand. Even more production capacity is scheduled soon. The big production of film has cut into acetate molding material production by over 1 million lb. a month because there is not enough acetate flake to meet demands for both.

The sulfur shortage, however, may back into the packaging material program any day now with serious results. Sulfur is needed for paper, cellophane, and Pliofilm production. Cellophane is now almost in balance, with some reports of a decline in consumer buying, but inability to obtain sulfur could raise havoc with production, and a cellophane shortage would immediately increase demands for plastics packaging materials.

Pliofilm, mentioned above, is today largely a civilian use product since airplane engine bags have been changed over largely to a laminate consisting of layers of vinyl 0.0012 in. in thickness (for heat sealing purposes); aluminum foil 0.0005 in.; polyethylene 0.0015 in.; and scrim. (See also p. 105).

Polyesteritis and Maleic Anhydride

Ever since World War II, the government's plastics technicians have been infected with polyesteritis. It's not a bad disease—they love its itch; they wish more people would catch it. In fact, the government folks have done a lot to keep it going. But now they are wondering where the materials to make it would come from if only two or three of their proposed projects are approved for military use and placed on full scale procurement.

The glass fiber generally used with polyester resins seems to present no long-range problem since several new plants are or soon will be under construction. Only six to eight months are required to get going. One of the largest polyester-glass processors says that glass is even tighter than resin, but producers say there is no reason to worry, that they can keep ahead of resin production over the long pull.

Styrene for polyesters

A lot of fuss has been made over the styrene monomer situation, but insofar as polyesters are concerned, it's practically an academic question. Over 600 million lb. of styrene monomer will be manufactured this year and surely there should be no difficulty convincing the government that polyesters are entitled to the small amount of less than 10 million lb. needed in 1951. Next year the styrene picture will be much different, and there should be enough to supply the amount needed for polyesters unless they boom even beyond optimistic predictions.

Maleic production is low

But maleic anhydride, another chemical needed for production of polyesters, is something different. It is produced either from benzol or as a co-product of phthalic anhydride production. Only about 60% of the industry's capacity was used in 1949. In 1950, production was estimated at considerably under 20 million pounds. In 1951, enough benzol will supposedly be available to make total maleic production reach over 40 million pounds. But the paint industry wants maleic in great quantity for alkyds. The business of getting 6 or 7 million lb. of maleic out of a total of 40 is much more difficult than getting 8 or 9 million lb. of styrene out of 600 million pounds. At least it's been mighty difficult up to this point. There are only five producers, and four are captive plants. One of the chief producers of maleic is also one of the principal producers of polyester, and may not be concerned, but other producers of polyesters are certainly nervous about the maleic shortage, for they see no assurance of alleviation such as there is in styrene. The situation is tense today but, unlike most other plastics shortages, even the outlook for the long range program is pessimistic.

Fumaric, succinic, and itaconic acids may also be used in polyesters, but production is quite small in each case. Furthermore, maleic anhydride is needed for production of fumaric and succinic. Fumaric, as well as itaconic, may also be obtained from the fermentation process. In any case, the part these small-volume resins play in polyester production is quite small—maleic is the key to increased polyester production, and that applies also to the alkyd molding powder program which is making great headway under today's heavy electronics demand.

Armed Services persistent for polyesters

Nevertheless, the Armed Forces are going ahead with their development of polyester-glass projects in anticipation that shortages will be overcome somehow or another. A far bigger boat than those produced to date is in development. Even what was once called the ludicrous landing mat is back in favor because of its light weight and resultant possibility of transport by air to meet special problems; a truck-transported water tank that would be 8 ft. long with an ovular shape 3 ft. on one axis and 4 ft. on the other is on the experimental list and sounds feasible. It won't rust; is light in weight; could be easily repaired; and supposedly would not affect the taste of the water. If it works, developers think the same idea could be applied to truck bodies.

These are only a few of the ideas involved. Some polyester promoters are a bit disgruntled at the government's attitude about cost of the finished product and point out that experimental contracts have been on a limited basis. They say that the assault boat, for example, which the Army claimed was too expensive because several aluminum or wooden boats could be obtained for the same price, could be produced at low cost if the order was for several thousand instead of less than one hundred.

Polystyrene

The demand for polystyrene is still in excess of supply but there is talk, in Washington at least, that the pressure had subsided. Either demand is down or molders have become reconciled to their cuts.

Biggest surprise of the month was the Tariff Commission's official report that 17 million lb. had been produced in February. Report had been widely circulated that only 12 million lb. had been produced that month. It's this column's guess that, barring accidents or strikes, there will be no less than 17 or 18 million lb. of polystyrene produced every month in 1951 if the industry wants it. This includes 1 million lb. a month or more of high-impact material. Such a guess is, of course, cancelled in case of a Russian war. Here's why we come to this conclusion:

Styrene production on the way up

There should be at least 650 million lb. and probably 700 million lb. of styrene monomer produced in 1951. Production was down a bit in January and February but the industry has proved it has facilities to operate at a 52 to 55 million lb. per month rate. One of the largest producers will increase production from 200 million lb. in 1950 to 240 million in 1951. Other producers may also come in with increased capacity this year. In addition, the Government's Los Angeles plant is scheduled for increased production.

Better benzol prospect

Benzol should be available to meet the need for styrene. Some increased production will come from petroleum, and there should be increasing amounts of imports. The Government is now buying benzol from Germany, and some of it will be available for purposes other than rubber. This is benzol that would ordinarily be used for motor fuel in Europe and therefore is not likely to be cut off for needs of the

European defense program. It is obtained virtually in trade for gasoline. A similar deal is in prospect with France if price can be arranged.

More styrene for rubber

The rubber program will consume 156 million lb. of styrene in the first half of 1951, 180 million lb. in the last half—or 336 million for the year. Maximum use will be 340 million for the year, counting the amount held in inventory or pipe lines; the actual total for the year may even be less. The 360 million figure commonly used is wrong; that would be the rate for a 760,000 ton rubber program, and the program won't reach that figure until July. Eventually the Government expects to reach an 860 thousand ton rate for GR-S but not until May 1952, and a lot of things can happen in the meantime.

Styrene for other products

To this 340 million lb. of styrene for rubber, add 80 million for other styrene uses such as in shoe soles, paint, polyesters, ion exchange, etc. That makes 420 million pounds. Subtract 420 from a possible 700 million and you have 280 million lb. for molding material which, when converted to polystyrene and other styrene molding materials, would be about 20 million lb. more than 1950. We are not optimistic enough to believe that the situation will work out quite so smoothly, but there's a big margin to play with when estimating that the polystyrene molding industry will have at least 18 million lb. of material a month in 1951.

There will be some ups and downs as there were in the first quarter when some styrene was diverted to rubber from private plants to make up for lack of production in the Government's Los Angeles plant; and there may be other adjustments to make when the Government increases its rubber production rate in July, before the new styrene capacity comes in. At that time there may well be more cries of shortage, if demand equals that of today, but the situation should balance out before the year is over if present plans materialize.

Possible changes in rubber program

There are so many things that could happen to the rubber program and the consequent availability of styrene that any prognostication is subject to immediate revision; but most of these changes, except in the 860,000 ton rubber program, would probably make more styrene available for plastics, always excepting the possibility of a natural rubber cut-off in case of war. The possibility of 100% butadiene rubber has been talked of many times, but it hardly seems likely that styrene producers are too anxious to see that happen. GR-S is, after all, a nice market for styrene, although polystyrene seems to be preferred because, for one thing, polystyrene is more stable in peace time.

Rubber experts also point out that the new process for adding oil may cut into styrene usage in rubber. Thus, when 25 lb. of oil are added to a master batch of 100 lb. of rubber, a resultant 125 lb. of perfectly good rubber can be produced. In June something like 6 million lb. of the rubber produced will be extended by the addition of oils.

Price Regulations

Regulation W-22, the general manufacturers' price control regulation, has created general griping in the plastics industry, but OPS officials report that almost no one has been in to register personal complaints or to make inquiry. Officials suggest that before processors complain about being forced to make a report on every item, they study the regulation carefully with reference to categories. It is possible that a molder may be able to classify his entire output under "injection molded products" or "compression molded products," or even put them both in one category and save a lot of paper work.

It is also a good guess that the deadline for reporting prices to the government by May 28 may be extended, but don't delay your preparation of the report any longer than necessary. It's a big job to get it in order.

Another hint: Don't be too sure that the new price regulation will result in a roll-back across the board. Not all items have advanced enough in price to go beyond the permitted increases for labor and raw materials. This pertains particularly to certain raw materials.

An amendment is likely on the provision requiring that a molder will have to wait 15 days before getting his new price approved after submission of his data.

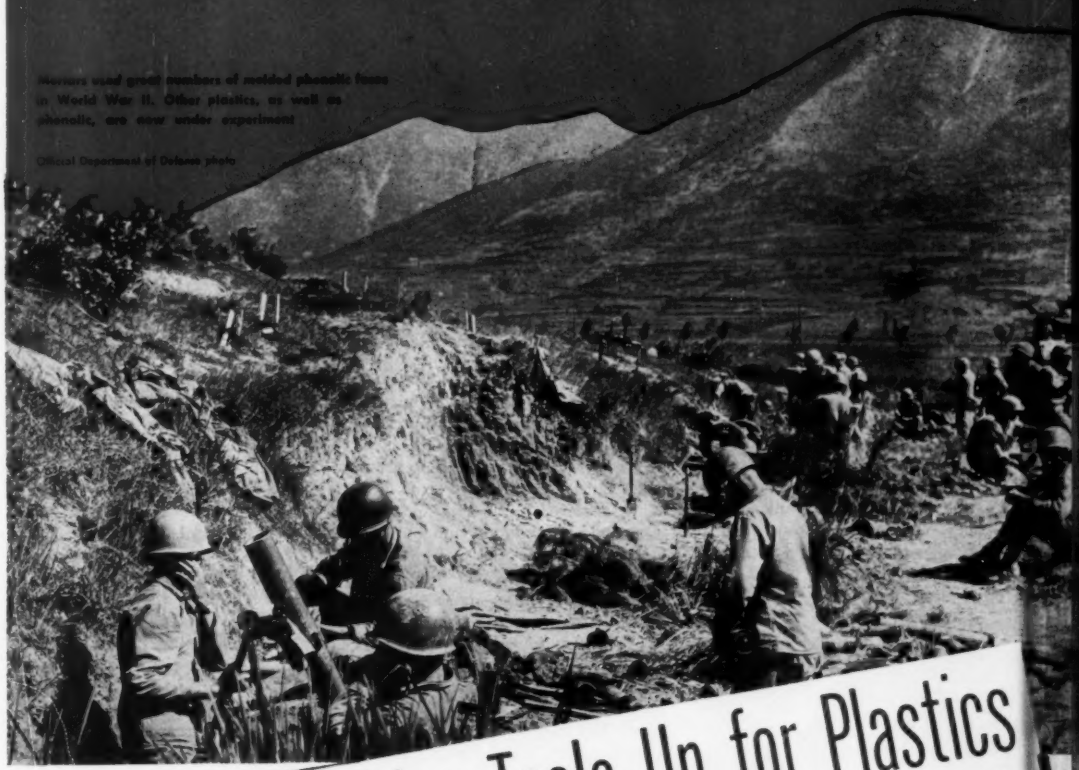
An effort is being made to adjust the situation for coated fabric processors because their pricing regulation won't permit the reflection of price increases for cotton textiles in the quarter ending Dec. 31, as cotton cloth for this period is customarily purchased in the quarter which ends Sept. 30. This attempt to adjust a special situation reflects the efforts that will be made by OPS to adjudicate undue hardships—in fact, it is quite likely that a new regulation may soon be drawn for hardship applications.

Whom to contact

Officials in OPS with whom plastics industry people will have most contact are W. L. Bossart of the Chemicals Div., who will handle materials including film; Robert Bell of the Consumer Durable Goods Div., who will handle plastics products; H. M. Baker of Textileather and with WPB in the late war period, who will handle coated fabrics in the Rubber Branch. All their offices are located in Temporary Building S, Washington, D. C.

MODERN PLASTICS

VOLUME 28 JUNE 1951 NUMBER 10



Mortars used great numbers of molded phenolic fuses in World War II. Other plastics, as well as phenolic, are now under experiment

Official Department of Defense photo

Defense Machine Tools Up for Plastics

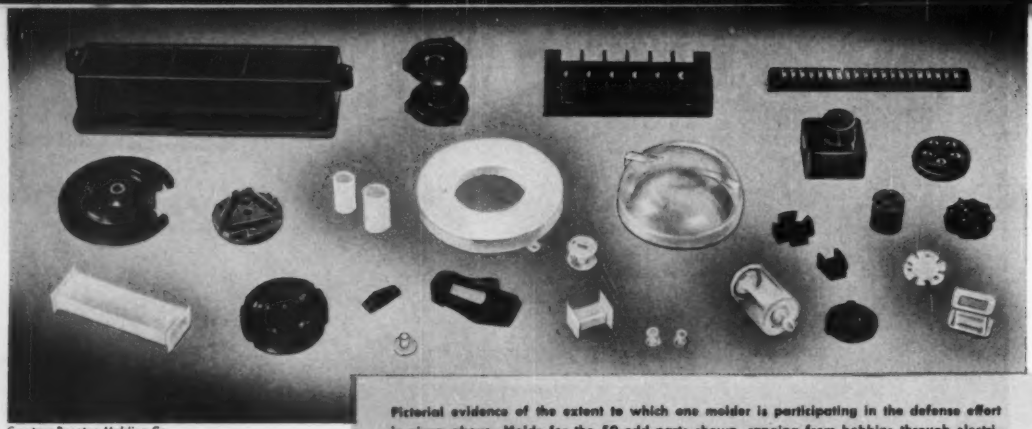
This article is concerned primarily with the development, use, and progress of representative plastics products that are currently in use or in a well advanced stage of development by the Armed Services. The reader will note that there is no mention here of polyester-glass products nor of plastics used in aviation since those subjects have been covered recently in feature articles appearing in this magazine.

BIGGEST question about plastics today, insofar as Washington is concerned, is not what and what for, but how much and how soon? Molders and processors have been flocking to the capital city in a never-ending stream to try to find the answer. No definite reply has been available up to now, but the clouds are beginning to move away. They must move away: the gigantic cost of the defense program can't be forever hidden from sight.

Something has to give somewhere along the line from the very weight of the project. Its size is indicated by a Defense Dept. announcement that procurement for this and the next fiscal year will total $87 billion exclusive of housekeeping expenses such as pay, transportation, and other personnel costs. This two-year volume of orders will have been completely placed by June 30, 1952.

The aim of the defense program is to have enough of everything on hand at all times to meet immediate needs, while avoiding accumulation of huge stockpiles of equipment which may become obsolete. Commitments totaled $5.7 billion in January and settled to a monthly rate of almost $5 billion in February.

Some reasons for the slow devel-



Courtesy Boonton Molding Co.

Pictorial evidence of the extent to which one molder is participating in the defense effort is given above. Molds for the 50-odd parts shown, ranging from bobbins through electri-

opment of definite commitments of plastics products to the defense program are listed as follows:

1) By far the most important government orders from a volume standpoint have been for big stuff—things like airplanes, tanks, electronics equipment. Many months have been required to get them under way. Even though the Cadillac tank plant, for example, came into production three months ahead of schedule, many other plants are still under construction, and many of the plastics parts which will be required in the products of these plants won't show up in DO orders for some time. Time required for tooling up, planning, and assembling equipment to produce defense products of complicated design is a matter of many months—sometimes more than a year. Many, many new weapons and types of equipment are under development—even in production. The government is inclined to move slowly with these new products until all the bugs are eliminated: authorities don't want arsenals full of equipment that may have operating defects or may become obsolete in a few years' time.



U. S. Army photograph

Assault wire, polyethylene and nylon insulated, is laid rapidly from truck

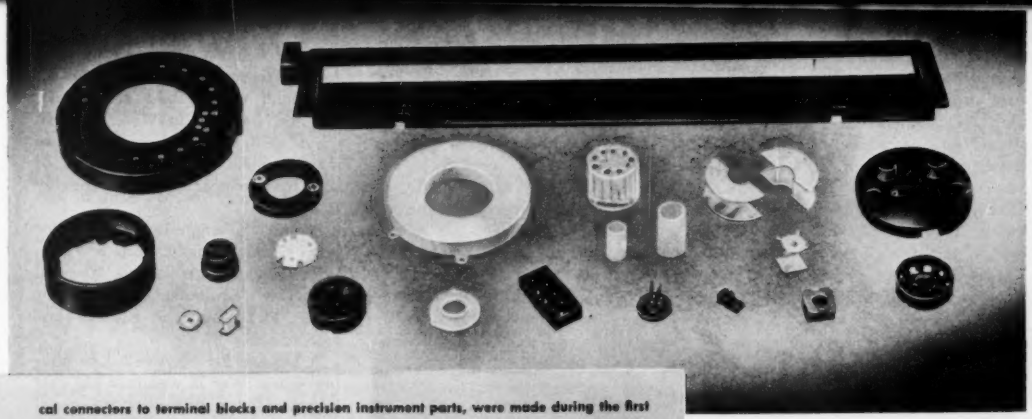
2) There were literally mountains of supplies in storage when Korea started, most of it surplus from World War II. Until very recently, at least, no small arms had been ordered since Korea. Even ammunition procurement has been comparatively small. There were hundreds of thousands of pounds of plastics involved in these two programs alone in the 1942 to '45 period. Plastics will eventually again be involved in these two and many other programs, but without necessarily duplicating the parts made before.

3) The mechanization whereby various government departments exchange plastics information has not yet been perfected. Some departments are much farther along than others in their capacity for coordinating plastics research and plastics product procurement, but some of the government's manufacturing plants where war items are produced and some of the depots where plastics are procured do not always consult with the research branches when such consultation might be helpful.

The foregoing criticism is aimed at a few specific and somewhat isolated cases, but there are enough such cases to make certain members of the plastics industry complain when they fail to get action on a project that has been hanging fire for months. Industry members recognize that a reasonable period of time must elapse before new and untried products can be tested and approved. However, the uncertainties and delays involved between the time a molder or processor first starts to begin negotiations and the time he actually pushes the button to start production are responsible for much of the criticism regarding the failure to get more plastics products into production more promptly.

Laboratory Coordination

There are currently at least seven well equipped plastics laboratories in the three main divisions of the Defense Department. In addition there are innumerable smaller laboratories or at least makeshift substitutes located in defense installations scattered throughout the country. Impartial observers believe that better coordination between these various laboratories and design engineers and procurement



cal connectors to terminal blocks and precision instrument parts, were made during the first three months of 1951. The materials used include phenolic, nylon, melamine, and styrene

men in the development and purchase of plastics products would alleviate some of the problems.

A sharp example of the uncertanties now confronting the industry is that, even today, NPA officials in charge of plastics have been given little idea of which and how much plastics the defense program is to include. Yet these men are expected to see that the necessary material will be available when wanted; that the civilian market will be as slightly affected as possible; and that small business will get a big hunk of the pie.

Small-Volume Plastics

So far, the amount of plastics actually taken or committed for defense products has been relatively small from the viewpoint of total production. These commitments have largely to do with comparatively small-volume plastics.

Thus, nylon molding compound is now largely committed to the jacketing for polyethylene-insulated infantry assault wire. At one time it was thought that the Army might want as much as 150,000 miles or more a month of this wire by fall, but any estimate today on a product which is so highly expendable as infantry wire is highly speculative and subject to drastic revision up or down. Every mile of this wire requires about 8 lb. of nylon plastic, and people in the plastics business are bound to scratch their heads and wonder where it would come from if production should reach the mileage just mentioned.

It is possible that some adjustment will be made by juggling the various types of nylon available, but there is no simple solution of the problem. In addition, nylon plastics are highly desirable for several other defense projects now on the secret list.

Other plastics in a somewhat similar category are the fluorinates—Teflon, Kel-F, and Fluorothene. All of these are almost completely allocated to DO orders. Heat and chemical resistance, plus superior electrical properties, make these plastics particularly valuable for weapons and electronics. Kel-F is even being tried as a container for whole blood. The small amount of these materials available and their use primarily in secret projects makes it impractical to discuss them here in more detail.

Along the same line are titanium and germanium organics for coatings and laminates which were discussed at the Gordon Research Conference at New London, N.H., last summer. Another is Boranamide, which will reportedly withstand 500° C. All of these are still in the laboratory stage, but if the Services show enough interest, there may be reason to hurry them along. The epoxy resins, too, are receiving considerable attention, especially for potting compounds.

Proximity Fuse

Ethyl cellulose is another of the plastics which are heavily overbalanced in the DO order scramble. In the 1942 to '45 period, a good portion of this material was used in the nose of the proximity fuse. Today there is some question as to whether or not that use will be repeated. Various other plastics are being tried. Only those who are working on the fuse can tell, and they won't.

Considerable confusion exists as to just what is going on in the proximity fuse program, and that is all to the good: no real American wants



U. S. Army photograph

Compression molded helmet liner is reinforced with plasticized nylon fabric

to tip off Joe Stalin on any details of this weapon, the deadliest of all except the atomic bomb. There is plenty of evidence to indicate that some type of proximity fuse has been frequently used in Korea with various elements of the land and air forces. In World War II, the fuse came along a little late for widespread use with land artillery although Gen. Patton used it to panic the Germans in the Battle of the Bulge. Up to then it had been used largely against Jap planes in the Pacific and German V-bombs in England. There are many molders in the country who worked on the fuse as Project-A. They doubtless know how to approach various sources and find out whether or not similar work is to be obtained in the future.



Official U. S. Marine Corps photo

Several thermosetting plastic parts are used in flame throwers, and these parts, essential to the operation of the weapon, are now on procurement from several different molders



Photos courtesy U. S. Navy

Rockets (above) of the type launched from airplanes (right) incorporate extruded ethyl cellulose inhibitor strips to maintain uniform combustion of the propellant charge. Large procurement is underway



Other defense uses for ethyl cellulose are in radio-sonde batteries; flashlight cases; field telephones; and tool handles. In World War II, ethyl cellulose film was used to make panels for identification of land troop concentrations to friendly warplanes.

Among the suggestions offered for ethyl cellulose applications are goggles, housings for various types of electrical equipment, rifle butt plates, gun plugs, and aircraft control wheels.

A big use for ethyl cellulose during World War II was in a dip coat compound for protection of metal parts in storage or shipment. The compound was about 25% ethyl cellulose; the balance was largely mineral oil. There was some complaint that this compound dried and chipped after years of storage, but the government is after it again, regardless. In addition, research is seeking to use cellulose acetate butyrate and vinyl in the same way. The government would also like to find a protective compound that doesn't require heating during the coating process. So far the result is blank.

By far the biggest current military application of ethyl cellulose is for rocket inhibitor strips. The extruded strip is about 1⅜ in. wide and ⅛ in. thick with a curved radius to fit the propellant charge. It is adhered to each of the four edges of a cruciform-shaped propellant charge. Experiment has determined the best position and the proper amount of inhibitor to keep the propellant burning at the right rate. In addition to the extruded strips, rockets also use two injection molded pieces, which are adhered to each end of the propellant. Many plastics have been tried for this job including acetate and vinyl, but problems of adhesion to the propellant and absorption by the plastic of nitroglycerine when

the rocket is in storage favor ethyl cellulose. The first strips were made of acetate and it is possible that acetate will be used again if ethyl cellulose becomes impossible to obtain in large enough quantities.

The rockets using these inhibitor strips are high velocity missiles launched from airplanes and rocket ships. The Army bazooka rocket, made to burn fast, has no inhibitor strip. The air-launched rockets are about the equivalent of a 5-in. artillery shell and bear such colorful names as Old Faithful, Holy Moses, and Tiny Tim. A new and bigger one, the Tarzan, is reported to be equipped with a proximity fuse.

Polyethylene

Polyethylene is hardly in the small volume plastics category, but insofar as civilian use is concerned, the amount available is considerably less than it was a year ago, even though production has been increased. Part of the reason is the assault wire mentioned above, which requires 14 lb. of polyethylene a mile, in addition to the nylon. There is also another wire coming along which will have a much bigger diameter. It will take many times more than 14 lb. of polyethylene per mile of wire, but the mileage won't be as great. This same wire will also require over 130 lb. of vinyl compound jacketing per mile. In addition, polyethylene will be required for insulation and spacers in the wire used for the radar fence. It would seem to follow that thousands of yards of polyethylene and vinyl splicing tape will be needed if all this wire is to be procured.



Submarine periscope (left) uses plastics in gaskets, other parts. Guppie submarines (below) have acrylic shield on deck

Defense Dept. photo (U. S. Navy)



Sectional shelter for use in Arctic regions has sandwich-construction walls. Inner and outer layers are vinyl-coated fabric; fibrous glass filler provides insulation

Bottles and Closures

The polyethylene bottle and closure business in the Armed Forces is as yet undefinable. A Medical Service official recently told this reporter that his branch would have nothing to do with such bottles and closures until they were adopted by the drug companies from whom they bought supplies; that he wasn't concerned about breakage from glass bottles because there was little of it; that it would take time to determine which medicinals could be bottled in polyethylene without reacting on or seeping through the material. Nevertheless, it is a foregone conclusion that the unbreakability and spray possibilities of polyethylene bottles will eventually demand the attention of the Armed Services despite the obtuseness of a few procurement officers.

The Medical Services, too, must have their eyes on polyethylene as a "most satisfactory substitute" for human bone and cartilage in plastic surgery. The total poundage for this purpose would be small, but would carry a high priority.

The Ordnance Departments also have a high regard for polyethylene but their work is largely secret. The polyethylene liner for the case of recoilless rifle shells has been frequently mentioned in print as has the powder bag for large caliber artillery shells, but both are reported as subject to change because of residue left after firing. A polyethylene igniter bag for containing the black powder used to set off the smokeless powder charge in artillery shells was described in this magazine over a year ago, but that too has been altered. The most desir-







Top: Official Defense Dept. photo. Center and bottom: U. S. Army photos

Top: U. S. infantrymen move forward, somewhere in Korea, carrying battle equipment plus food ration kits. These kits (contents of one are shown in center) are using millions of pounds of plastics in the boxes, in thin film laminated to foil or paper, in spoons, and in can coatings. In most of these applications, the plastics materials are an important factor in contributing protection against moisture and contamination

able item for this purpose would seem to be thin paper coated with polyethylene. Other plastics and various fabrics are also being tested.

In fact, there are scores of places where polyethylene would fit into the military program, if more material were available. Even a polyethylene molded soap box is called for by one Army spec which was drawn up before Korea intervened to cut polyethylene availability. An ideal application is a sipper for hospitalized patients; it can be sterilized and reused.

Packaging

The list of possibilities is endless, but probably the greatest of all except wire coating is packaging. The disturbing factor here is that Service people are so alarmed over the possible unavailability of polyethylene if global war were to break out that they are looking for substitute materials that can be used in place of polyethylene in present low priority applications.

There is some difference of opinion as to whether or not this is the correct course. Producers feel that polyethylene is inherently fitted for packaging purposes and should command just as high a priority for that use as for any other military purpose—but Army authorities are careful to point out that no changes will be made unless polyethylene is unavailable.

The uses of polyethylene film and polyethylene-coated paper for packaging are well known. For wrappers and liners to use in containers for hygroscopic materials polyethylene rates high. It has low permeability; ages well; is tasteless and odorless; has no plasticizer to migrate; is non-toxic; is easy to work; gives low cost per unit of area since it will provide about 30,000 sq. in. per lb. of thin film in comparison to from 20,000 to 24,000 of various other films; resists grease; is strong and translucent; and has low temperature flexibility. The combination of all these properties in one material and the additional spread of usefulness obtained when it is coated on paper makes polyethylene a highly utilitarian material. Furthermore, polyethylene production is scheduled for large scale increases over the next few years. The big question today, then, is whether or not substitutes should be employed temporarily for a material that may be available in sufficient quantity for the government's military packaging needs when and if global war breaks out.

Film Laminates

One of the most worrisome of these problems is the polyethylene used to wrap packages in ration kits. These wrappers are generally foil or paper laminated with layers of polyethylene, acetate, vinyl, saran, Pliofilm, and other materials in a great variety of combinations depending upon the item to be wrapped. Each plastic is chosen to give added properties of protection which foil alone does not provide. Foil itself might also become short

in a global war and one of the possible replacements for that could be saran laminated to paper.

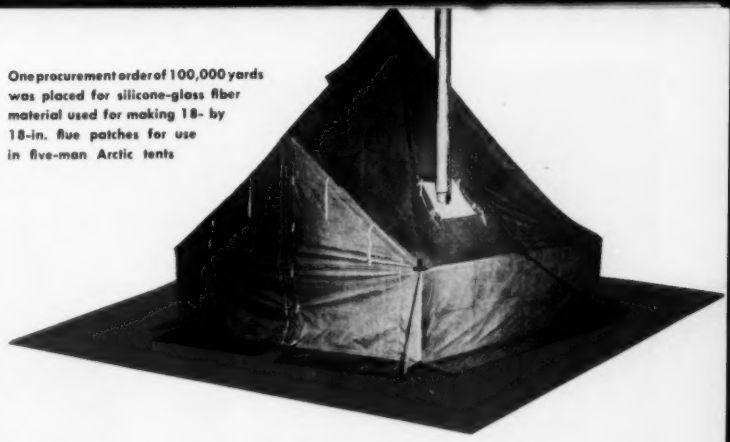
Great hope has been expressed in Quartermaster Corps circles that a newly developed 2-mil non-toxic, plasticized vinyl film can be used to supplement polyethylene film in some packaging applications. An example of where vinyl might be used is the small personal-effects bag in a ration kit which has heretofore been polyethylene. Vinyl-coated paper also has promising possibilities as a wrapping material.

A neat packaging possibility for polyethylene, if enough material is available, is found in a molded box with a cover similar to the patented locked-on-lip of the Tupperware dishes. The box, filled with oil, would hold small metal parts for shipment and storage. This is an Ornance Dept. job.

The famous Ordnance Wrap developed in World War II as a moisture-vapor and grease barrier will consume thousands of pounds of plastics in the present emergency. There are many combinations possible for wrappers, bags, and case or drum liners. Generally speaking, they all follow a similar construction pattern. The base may be scrim or asphalt-treated paper to which are laminated various plies of metal foil and plastics film such as acetate, polyethylene, vinyl, saran, etc. In some cases the wrapper is also treated with microcrystalline wax. A great deal of study has gone into the problem of which combination will best withstand -60° temperatures; the man or company who comes up with the best answer to that requirement is going to make a lot of money.

More use of metal foil and polyethylene because of their low temperature resistance would seem to be indicated at present. The transparent aviation engine bag of World War II is still in most general use, but will be supplemented by a foil bag into which plastic windows are inserted so that the dessicant container may be observed.

One of the more noteworthy packaging developments for the Armed Services since 1945 has been the application of a comparatively new petroleum-derived chemical called dicyclohexylamine nitrite to paper or fabric for anti-corrosion wrappers. Other materials are now



One procurement order of 100,000 yards was placed for silicone-glass fiber material used for making 18- by 18-in. flue patches for use in five-man Arctic tents

on the market for which similar claims are made, but the above material, labeled VPI (vapor phase inhibitor), has had a thorough four-year testing with good results.

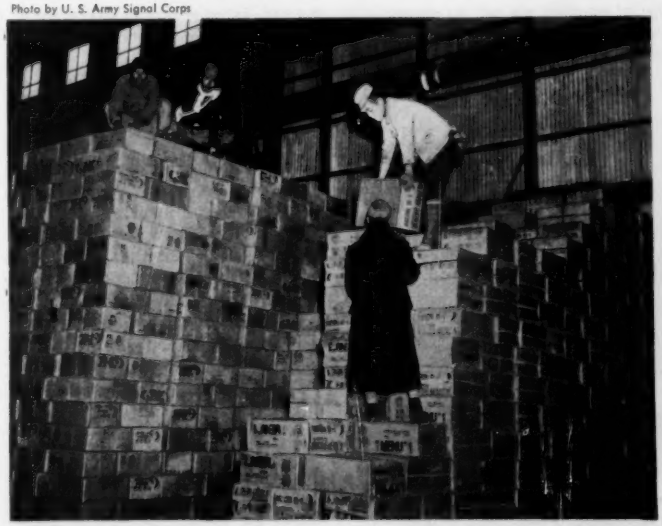
VPI was originally developed to prevent corrosion in gasoline pipe lines. When impregnated in cloth or paper, it is successfully used commercially as a wrapper for ball bearings. The Air Force has been experimenting with such wrappers for parts shipments for over a year; one such wrapper is now being used for machine guns. The most sensational claim made for VPI is that it may eventually eliminate the need for cosmoline, a heavy grease in which guns are packed. Any soldier or sailor knows that cosmoline is one of the "damnedest" nuisances in existence—in fact, its removal is frequently hazardous because soldiers often use gasoline to cut the grease and disastrous fires have resulted.

The nitrite-impregnated wrapper means much to plastics. If cosmoline should be completely abolished for small arms storage and shipment and VPI wrappers adopted, thousands of pounds would be needed, and various plastic films would be used as one or more plies of the wrapper. One manufacturer even

(*Continued on p. 200*)

V-Board, containing melamine, urea, and polyvinyl alcohol, is the answer to the problem of protecting Army supplies against the effects of weather, handling, and storage

Photo by U. S. Army Signal Corps







All photos courtesy B. F. Goodrich Chemical Co.

Variety of plant reproductions, made of vinyl plastisol in foil molds, arranged to serve as a durable, easy-to-care-for interior decoration

Simulated plant leaves are fire resistant; in demonstration illustrated at left, they do not support combustion when exposed to an open flame

Vinyl Plants are True to Life

INTERIOR decorators, following the current trend to "bring the outdoors in," are now using plastic plants and foliage in many hotels and stores because of the advantages which they offer over natural flora. As attractive as natural leaves, the plastic reproductions require no care except an occasional wiping, will last virtually forever, and are highly fire-resistant.



Plastic plant leaves are produced in 190 varieties, in wide range of sizes

Over 190 varieties of natural foliage, including such well-known plants as Chinese evergreen, philodendron, and aspidistra, are being authentically reproduced in vinyl plastic by Plastic Plants Co., Cleveland, Ohio, by a process which accurately duplicates the leaf structure of living plants in every detail —coloration, veining, configuration, and texture.

The plant leaves are made from an Ameran polyvinyl plastisol supplied by American Anode, Inc., Akron, Ohio. This material incorporates a non-migrating plasticizer, is impervious to most chemicals, and can withstand temperatures from 175° above to 35° below zero F.

In production of the vinyl plant foliage, live leaves imported from all over the world are temporarily preserved in a formaldehyde solution with glycerin. When a mold is to be made, a leaf is quickly chilled to 70° below zero and a sculptor's plaster impression is made of it. Production molds are then produced in 0.0009-in. copper through the use of the plaster casting. A heavy metal casting ultimately becomes the master die so that additional production molds are readily produced. The foil molds are completely disposable, the metal being continually reprocessed in an automatic conditioning machine.

Curing of the plastisol is accomplished in combination thermostatically controlled ovens using both infra-red and gas flame heat. The curing period is under 19 min., depending on leaf size and thickness.

Over-all coloring is applied to the leaves during the curing process. Jets of coloring agents, including ground inorganic dyes and oil pigments dispersed in solutions of linseed oil and soya oil are directed over the surfaces of the molds in a predetermined quantity. The humidity control at this point removes excess coloring matter from the under surface of the mold, and a high vacuum is employed to force coloring agent into curing material.

Color separation in the leaves is done by hand with injection needles, and follows design detail charts taken from the living foliage. All coloration is authenticated by spectroscopes that compare the light reflections as well as the transparency of living and plastic foliage.

THE BABIES ARE BUSY

How injection machines of 2-oz. and less capacity are breaking bottlenecks, cutting costs, speeding production



Courtesy Moslo Machinery Co.

Diversification of the output of the "baby" plastics injection machines is at least partly demonstrated by this photograph which illustrates the wide variety of molded products that are turned out on molding equipment produced by one machine manufacturer

MUCH attention has been given during the past few years to the race to manufacture bigger and still bigger injection machines. As a result, many people have lost sight of the "babies" of the injection molding business—machines of 2-oz. capacity or less. The habit of classing these units as laboratory machines has lead many to think of them as being useful only for experimental purposes. Nothing could be further from the truth. Many large scale installations of these small machines have been made recently and are being operated on a full-scale production basis. Hundreds of these small-capacity units are today producing parts ranging from buttons and decorative stones for jewelry through toys up to industrial parts demanding a high degree of accuracy.

In a recent survey of this sector of the injection molding field, every molder interviewed had nothing but praise for the productivity of small machines. Numerous statements were made regarding cost savings in dies and operational expense over larger machines. In some cases these were the results of change-over from multi-cavity molds in large machines to molds with fewer cavities in the "baby" machines; in every case, of course, the molded parts were comparatively small in size.

Some molders have even built "Rube Goldberg" molds for their small machines which no "large" molder would ever think of designing. One example is a four-cavity mold for a 15-in. knitting needle designed with metal inserts on the tips of each needle. The parts are gated at one end only—directly under the nozzle. This causes the major portion of the mold's length to extend out from the machine's clamp. A series of "C" clamps adapted for quick opening and closing serves to clamp the protruding part of the mold during injection. This may sound silly, but the set-up works.

Results Count

A number of representative jobs being run on small injection ma-

chines are described below. These by no means exhaust the production possibilities of such machine units, but by their diversity they indicate the potentialities inherent in the "babies" of injection molding.

The A. C. Gilbert Co., New Haven, Conn., uses a 1½-oz. Impco injection machine to mold such parts for its model railroad sets as sides for a boom and work car, couplers, and box car doors, as well as replicas of stock yard steers.

Two 10-cavity molds are used to mold the mating parts of the coupler. In three shifts, approximately 36,000 train couplers are turned out on one machine. The company states that elimination of trimming and inspection operations have resulted in substantial economies. Quality is uniformly good, in some cases better than the quality of pieces molded in a larger mold on a 12-oz. machine.

Gilbert has also found that, where molds were changed from larger machines, operating speed was equal or in some instances as much as 10% faster. The coupler mold is designed as a three plate construction with auxiliary sprues. This design permits the gate to be sheared as the mold opens, thereby eliminating all finishing operations.

Phonograph Records

Two 2-oz. Impco machines are in operation at Shelley Products, Ltd., Roslyn, N.Y. These machines are producing micro-groove phonograph records at the rate of one every 30 seconds. A special phonograph formulation of Bakelite styrene is used for this operation. In this set-up, an auxiliary runner plate permits the phonograph record to be gated in the center. The upward acting hydraulic ram, which is a specialty of the Impco design, is used to shear the gate and punch the center hole in the record clean while the mold is still closed. An added feature of this operation is the molding-on of labels. Both labels are used as inserts in the mold.

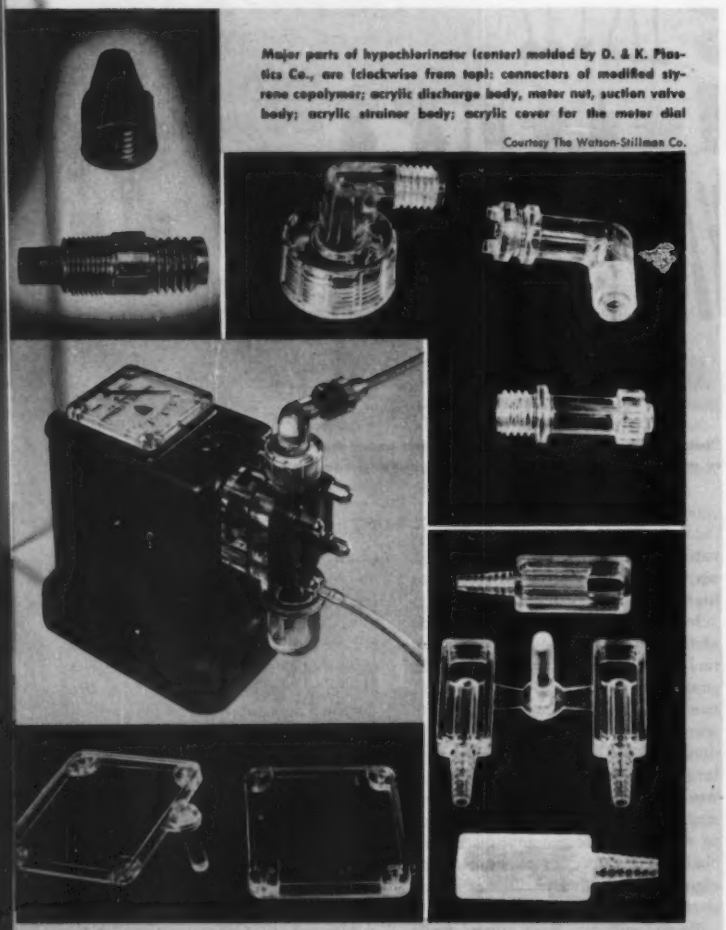
Thus, when the mold is opened, no further manufacturing operations are required with the exception of inspection and packing.

An injection machine especially designed by Moslo Machinery Co., Cleveland, Ohio, known as the Duplimatic, is being used by several companies for molding vinyl caps for electrical plugs. These caps enclose the contact prongs and the ends of the connecting wires. This machine has a vertical clamp and a horizontal injection cylinder. It is equipped with one set of upper cavities mounted permanently in the movable half of the clamp end of the machine. Two sets of lower cavities are mounted on a movable table which traverses right and left in order that each set of lower cavities is alternately in the molding position and then in the loading and unloading position. The two brass contact prongs soldered to the ends of a length of two-conductor vinyl insu-



Courtesy The Watson-Stillman Co.

Cap for tube is made in 6-cavity mold by Anderson Tool Die & Machine Works



Major parts of hypochlorinator (center) molded by O. & K. Plastics Co., are (clockwise from top): connectors of modified styrene copolymer; acrylic discharge body, motor nut, suction valve body; acrylic strainer body; acrylic cover for the motor dial

Courtesy The Watson-Stillman Co.

lated wire are used as inserts in each cavity.

In operation, the lower cavities are loaded with inserts. The wire extending from the brass prongs hangs down in front of the machine so that it does not interfere with the molding operation. Pressing the starting button causes the table containing the lower cavities to move sideways and bring the loaded cavities into molding position. The upper cavities then come down, clamping pressure is applied, and the injection sequence follows. While the molding operation is proceeding, the operator loads the second set of lower cavities with its inserts.

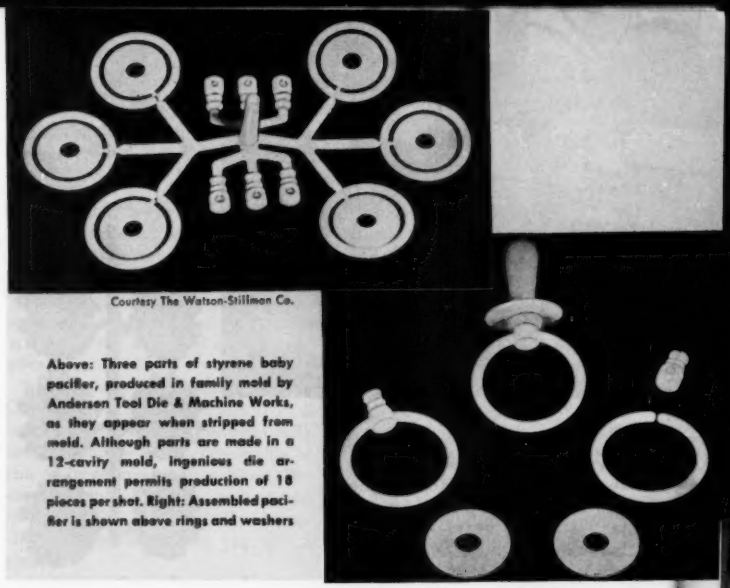
After the injection and cooling cycle has been completed, the mold opens. All of these operations are automatic and merely require the operator to press the starting button for them to proceed. This machine is also equipped for fully automatic operation; when the operator becomes highly skilled, the fully automatic feature may be used.

Royal Electric Co., Inc., Pawtucket, R.I., states that these machines provide completely automatic, trouble-free operation. In addition, their compact construction permits easy installation and results in a floor space saving which is a great material handling asset. The same type of machine is also being used by Lectroloid Co., Brooklyn, N.Y., and by Rego Electric Co., Hoboken, N.J. for the production of similar electrical plugs. Production rates per hour with six-cavity molds vary from 650 completed plugs to as high as 950, according to the efficiency of the operator and the auxiliary equipment.

Tilting Head Clamp

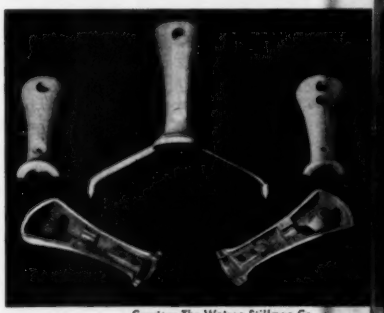
Green Plastics, Inc., Wakefield, R.I., makes a specialty of the production of decorative tie-back pins for drapes. The company has a set-up consisting of a 1-oz. fully automatic Moslo machine equipped with a tilting head clamp assembly. The floral design illustrated is molded of Koppers styrene. It has a shank about 7/16 in. in diameter with a small hole molded in. Pointed metal pins are forced into this hole by an automatic machine. The thickness of the button itself is about 3/32 inch.

The over-all view of the machine shows an interesting set-up for high speed fully automatic operation. When the mold opens, the complete shot drops out onto a chute, down which it slides into a pan of cooling water. Only one source of cooling water is used for both the mold and the pan. After the water circulates through the platens of the mold it is directed to the top of the chute down which it flows into the pan. An overflow pipe connection on the pan drains excess water continuously. This feature of directing the cooling water to the top of the chute not only aids in carrying the molded pieces down to the cooling pan, but



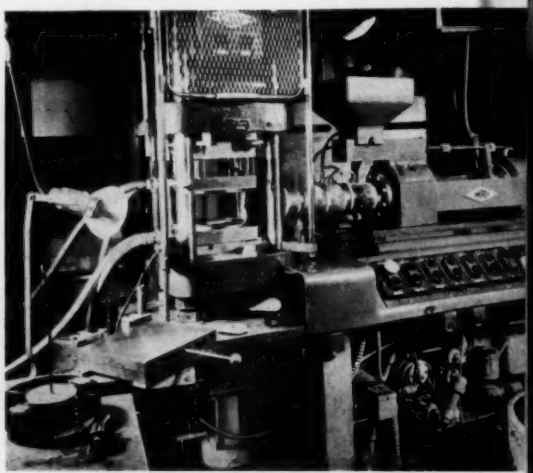
Courtesy The Watson-Stillman Co.

Above: Three parts of styrene baby pacifier, produced in family mold by Anderson Tool Die & Machine Works, as they appear when stripped from mold. Although parts are made in a 12-cavity mold, ingenious die arrangement permits production of 18 pieces per shot. Right: Assembled pacifier is shown above rings and washers



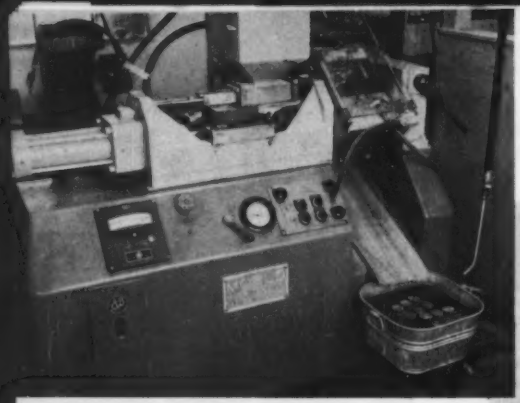
Courtesy The Watson-Stillman Co.

Prod handle for battery tester made of modified styrene by Heyer Products Co.

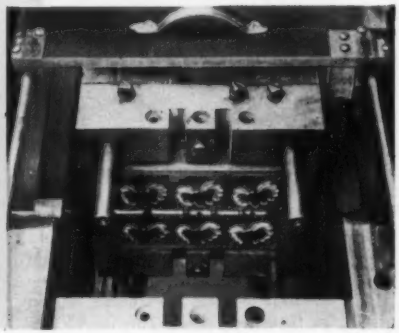


Courtesy Improved Paper Machinery Co.

Micro-groove phonograph records, made of special styrene formulation, are produced on 2-oz. machine by Shelley Products, Ltd., at rate of two a minute. Records are center gated—are ready for packing when mold opens







Decorative tie-back pins for drapes made by Green Plastics, Inc., (below, center) are molded of styrene on 1-oz. automatic injection machine. Left: Over-all view of machine shows chute leading to pan in novel cooling water system. Below, right: Upper half of mold after pieces have dropped out

Photos courtesy Moslo Machinery Co.

also speeds up the cooling, simply because the cooling action begins the instant the molded pieces hit the chute.

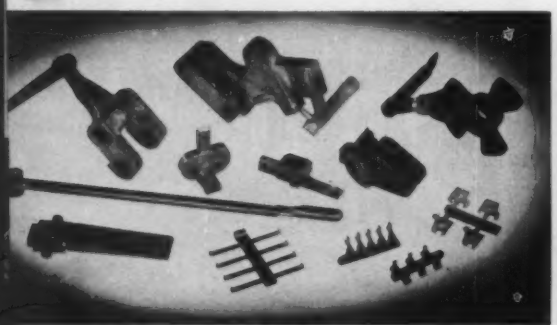
The drapery pin pieces are pin point gated and, therefore, practically fall off the sprue. Thus any subsequent finishing operations are eliminated, with the exception of assembly of the pointed metal pins. The particular job illustrated runs on a 7-sec. fully automatic cycle, which results in a net production from this six-cavity mold of 4500 parts per hour. The only attention the machine requires is to keep the material hopper loaded and to remove the finished parts from the cooling bath at intervals.

Bottleneck Breakers

The Watson-Stillman Co., Roselle, N.J., produces 2-oz. injection machines as well as most general sizes of larger injection machines up to and including the largest units made to date. When this company makes a statement about small injection machines, it must be given a great deal of weight because of the company's experience in all sizes of machines from the 2-oz. "babies" up to the 300-oz. "giants." It states: "Manufacturers are realizing more and more the potential of these machines and the important part they play in solving many of their production bottlenecks."

Watson-Stillman points to D. & K. Plastics Co., Belleville, N.J., as a perfect example of a custom molder which has made a success through the use of a battery of 2-oz. machines. This company claims that, because of the low pressures involved in the small machine, molds do not have to be case hardened, thus not only eliminating the hardening costs, but also the cost of hand polishing. D. & K. has had runs of well over one million pieces in unhardened dies with satisfactory production throughout.

Heyer Products Co., Inc., Belleville, N.J., manufactures electrical testing equipment for the automotive industry. This company has turned to the use of plastics for more than 10 different items it is using on its standard equipment. All the parts are being made on a Watson 2-oz. vertical injection machine. Styrene, acrylic, and U.S. Rubber's Kralastic are used for the various pieces which range from handles, buttons, and dials to lenses and cov-





Photos courtesy The Van Dorn Iron Works Co.

Precision parts produced by investment casting, using styrene patterns molded to close tolerances by Casting Engineers, Inc., on 2-oz. machine

Battery of 2-oz. presses which turn out various products at Colonial Plastics Mfg. Co. Machines have made operating economies possible

ers. Shots ranging from ¾ to 2¼ oz. have been made on runs of from 10,000 to 80,000 pieces. The molds range in size from two to six cavities.

Cost Lowered

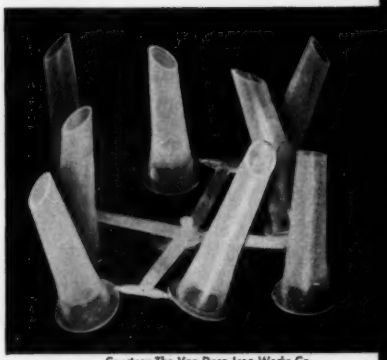
Wallace & Tiernan Co., Inc., Newark, N.J., produces chlorine and chemical control equipment. When the company was designing a new hypochlorinator, it decided to use plastics for various important components of the new unit. The purpose of this new piece of equipment, called the Chlorinet, is to purify water in small systems such as those used in private homes, summer camps, and on farms. The device had to be simple, compact, and dependable, yet it had to be priced within the reach of its intended market. The plastic parts finally decided upon aided greatly in insuring a rugged and dependable unit and at the same time permitted it to be sold at a lower price than if other materials had been used.

The molded parts of the Chlorinet are all produced by D. & K. Plastics Co. Lucite was selected for five of the parts—the discharge body, a meter nut, a suction valve body, a meter dial cover, and a strainer body. Kralastic is used for a threaded part which connects the unit to the water supply as well as for a tubing nut used for the same purpose. A molded vinyl ring gasket is used in the assembly of the completed unit.

Inasmuch as the production of the Chlorinet is somewhat limited, it would not have been economically sound to make production molds to run on large injection machines. The use of single cavity, unhardened molds in 2-oz. Watson-Stillman machines made these jobs pay off in plastics.

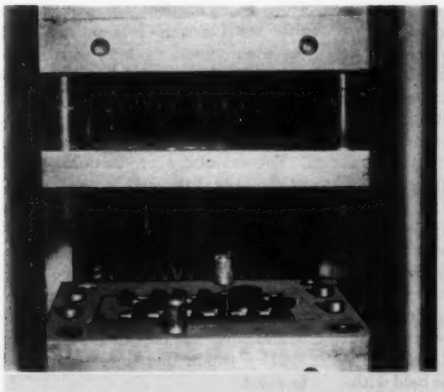
Anderson Tool Die & Machine Works, Brooklyn, N.Y., is using a 2-oz. Watson-Stillman machine for the production of television adjusting screw covers. An 18-cavity mold is used for these parts, and the machine is run on a 20-sec. cycle. Over one million of these screw covers have been molded of Tenite to date.

This same company also molds a baby's pacifier of styrene. Three different parts are assembled to make this pacifier. All three parts are molded in a combination or family mold. Through ingenious mold design, six of the mold cavities produce two different pieces each; namely, the pacifier ring and a round washer. Because the washer is slightly smaller in diameter than the ring, the washer can be molded inside the ring. Thus, although the mold is actually a 12-cavity job, it produces 18 pieces per shot. A half million pacifiers have been molded to date, and the speed of operation is approximately 18 complete units per minute.



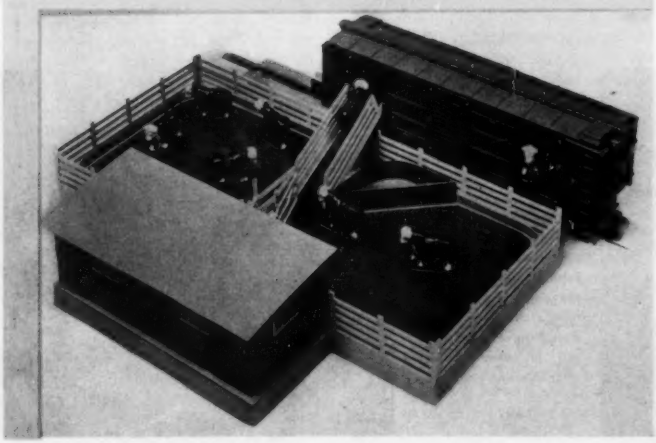
Courtesy The Van Dorn Iron Works Co.

Caulking gun spouts in 2-oz. polyethylene shot by Colonial Plastics Mfg. Co.



Left: Couplers for model electric trains are molded on 1½-oz. injection machine. Die is of three-plate construction with sprues pulled by sucker pin. Below: Other molded train set accessories include stock yard steers, sides for boom and work car, and box car doors

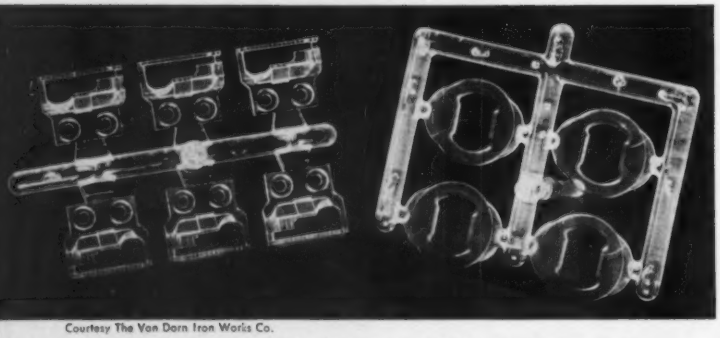
Photos courtesy The A. C. Gilbert Co.



Light and Compact

Colonial Plastics Mfg. Co., Cleveland, Ohio, is a typical custom molder with injection equipment ranging in capacity from 2 to 16 ounces. This company finds a very definite place for the 2-oz. machines in its operations and now has four 2-oz. Van Dorn machines in operation. Products made on this equipment include: caulking gun spouts; tips and fender mount parts for automobile aerials; electrical grommets; and automotive battery parts. Runs often exceed 100,000 pieces.

The advantages found by Colonial



Courtesy The Van Dorn Iron Works Co.

Mold with small number of cavities simplifies task of holding close tolerances in these styrene precision casting patterns made by Haynes-Stellite Div. in a 45-sec. cycle

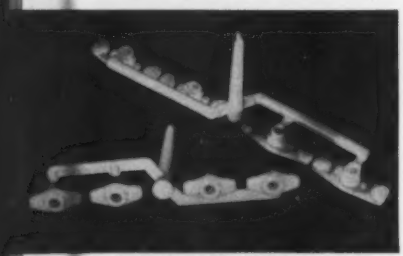
in these 2-oz. machines are reported as follows: The initial investment in machinery is low; the molds are not expensive; operating costs are low; and set-up time is short. Also, because the equipment is light and compact, it needs little space and does not require high floor strength. It is therefore adaptable for use in locations where larger machines could not be placed. Another advantage cited by Colonial is that little material is lost when changing from one material to another.

Casting Engineers, Inc., Chicago, Ill., is using three Van Dorn 2-oz. machines for custom molding styrene patterns used in precision investment casting. In this method of casting, the mold is produced around the patterns and the patterns are then removed by melting or by other means of disintegration. Styrene patterns have a great advantage over wax in that they are far less fragile and are said to be more accurate. Because of the precise nature of this work as demanded by the ultimate steel casting the molded patterns are produced under rigid dimensional control. Casting Engineers' quality control set-up requires that every piece in the total production run of one pattern must be held within tolerance limits from one to the other of no less than 0.003 inch. The company states that its 2-oz. machines continuously produce styrene patterns within these tolerance limits.

Protective Closure Co., Inc., Buffalo, N.Y., uses a 2-oz. Van Dorn to produce CaPlugs—polyethylene cups used to protect threaded parts and tubing. This company produces these cups in numerous sizes and designs, using 20-cavity molds run on a 15-sec. cycle. This company states that in its uphill battle against rising labor and material costs, its 2-oz. machine has helped tremendously in reducing overhead and thereby has helped to keep selling prices as low as possible.

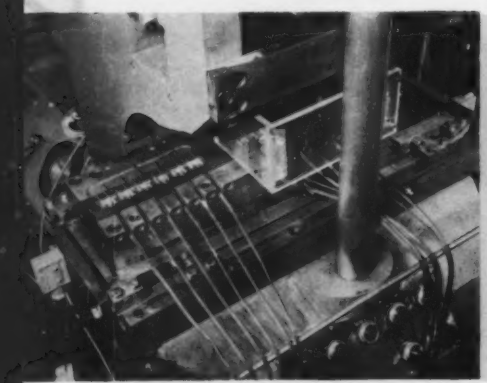
Varney Scale Models, Chicago, Ill., molds a variety of small detail parts which simulate the parts in use on prototype railroad cars. Such parts as tank car ends, passenger car ends, brake equipment, car wheels, and a number of other similar items are in daily production on a 2-oz. Van Dorn machine. The company states that mold set-up is easy and that die maintenance is held to a minimum. It also claims that operators are readily trained to run the small machine and to work with a minimum of supervision.

The list of the production accomplishments of the small injection machines could be continued almost indefinitely, piling repetitious example on example. But enough has been recorded here to prove the point, to prove that the "babies" are not just laboratory or experimental machines; they are carrying a man-size load on production lines from coast to coast.



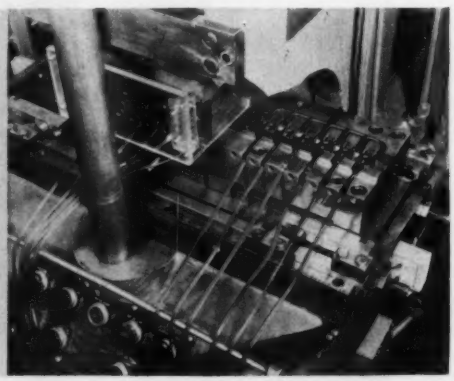
Courtesy The Van Dorn Iron Works Co.

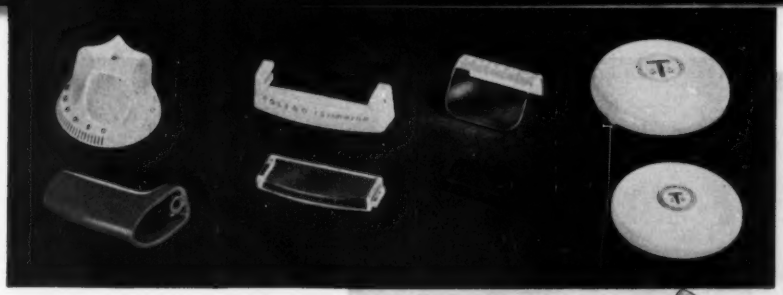
Textile machine parts made of nylon in cam action molds by M. J. McHale Co.



Photos courtesy Maslo Machinery Co.

Press for molding vinyl caps for electrical plugs has set of permanently mounted upper cavities and two sets of indexing lower cavities. Left: Loaded lower cavities, showing how brass prongs are used as inserts. Right: Molded plugs still in lower cavities after injection is finished





Plastics were selected for a specific job in each of eight components of new food slicer. Parts (left to right) are: top row—slicer gage knob of white urea, polystyrene chart casing, acrylic lamp shield, urea sharpener cover; bottom—slicer handle of red ethyl cellulose, acrylic chart cover, phenolic slide block, urea housing end cap



Unusual feature of slicer is weight estimator enabling operator to weigh slices without transferring them to scale. Chart casing, lower right, on estimator, is molded of high-impact polystyrene, since casing acts as handle for tray. Graphite-filled phenolic slide block, not shown, is molded to close tolerance to insure uniform slices

Eight Parts—Five Plastics Materials

Slicing machine has urea, acrylic, styrene, and ethyl cellulose exterior parts and graphite-filled phenolic slide block

THE designers of the new Toledo slicer recognized the need for the right material for each job when they specified five different plastics materials to be used in eight small parts of the machine.

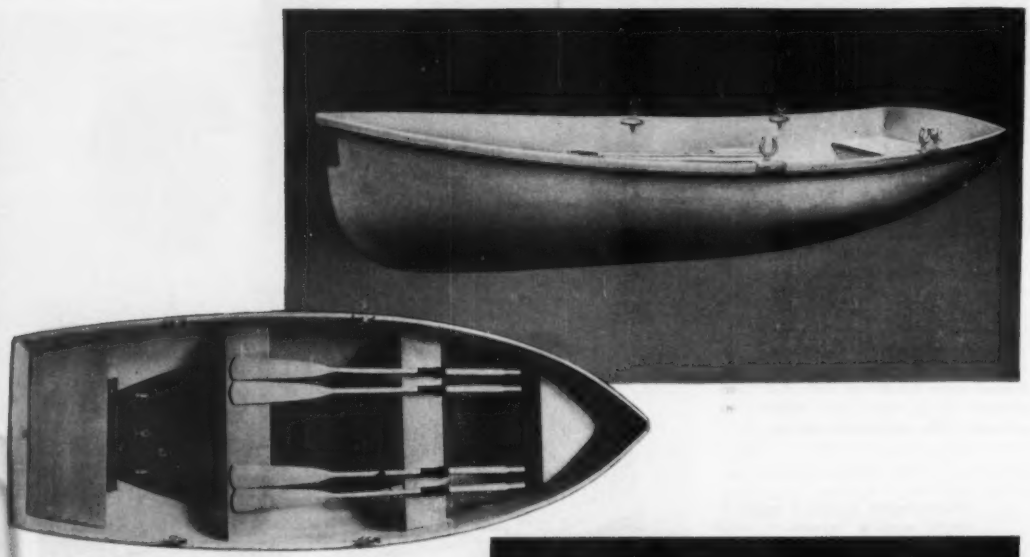
The model 5400 slicer was designed for Toledo Scale Co., Toledo, Ohio, by J. M. Little & Associates, Toledo. Plastics Div., Continental Can Co., New York, N. Y., engineered and molds six of the plastics parts. A urea knob for the machine is molded by Auburn Button Works, Inc., Auburn, N. Y., and an ethyl cellulose handle by Michigan Molded Plastics, Inc., Dexter, Mich.

One new feature of the machine is the Quick Weigh Estimator, a device which enables the operator to determine the approximate weight of the slices without transferring them to the scale. The chart casing on the estimator device is molded of gray high impact Styron. The high impact material was necessary because the casing serves as a handle for removing and carrying the weighing tray. The chart cover which fits tightly into the chart casing is molded of high-heat resistant Lucite acrylic.

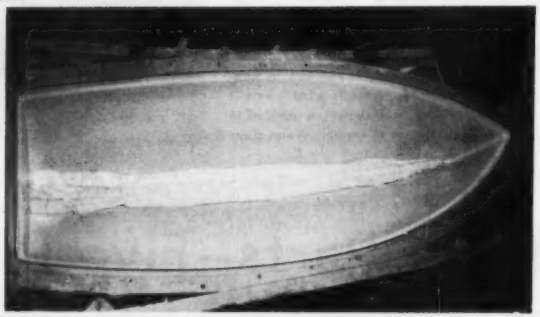
The lamp shield above the weighing tray is also molded of acrylic. A high-heat material was necessary because the shield is close to a 15-watt bulb. The name Toledo is molded-in to the top part of the shield, and the letters are painted so that the piece serves as a name-plate as well as a light shield.

The handle of the slicer is molded of red ethyl cellulose, chosen for strength, and the slice gage knob is molded of white Plaskon urea. The molded-in figures on the white knob are filled in with black. The sharpener cover and the housing end cap are also molded of urea. These pieces are gray.

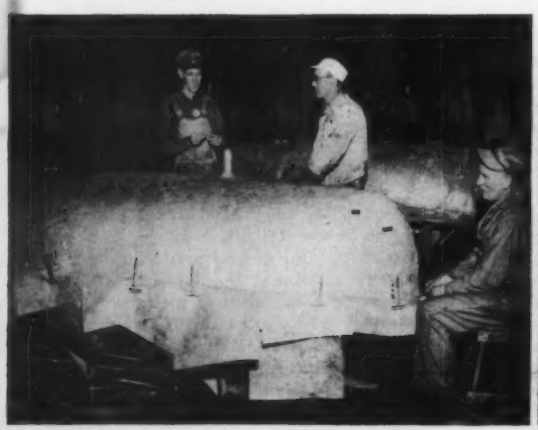
The plastic part which performs the most exacting task is the slide block, which travels between two 15-in. long rails and makes one complete trip over and back for each slice. Any variation in the dimensions of this block would affect the thickness of the slice. This block is molded of a Bakelite phenolic material filled with graphite to make the piece self-lubricating.



Durable, easy-to-maintain 12-ft. wherry is molded of polyester resin and glass mat. Blocks of polystyrene foam under the thwarts serve as floatation material, and the boat will hold eight men with plenty of freeboard



Interior of female portion of matched mold for 12-ft. wherry, showing keel preform in place. Lay-up is done on plastic jigs, leaving molds free for production



Workers lay up glass mat reinforcing material on plastic jigs which are shaped like male part of mold in which the boat is actually produced



After lay-up is in place, the two halves of the mold are bolted together and are ready for the injection of the liquid polyester

'Operation Plastic Boat'

SMALL plastic boats are being produced on an assembly line basis, according to a recent announcement by the Bureau of Ships. The method is being used to turn out 12-ft. wherries at a one-a-day rate at the Puget Sound Naval Shipyard, Bremerton, Wash.

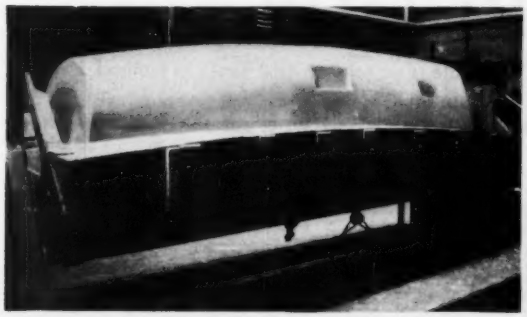
The process in use involves pressure-injecting liquid polyester resin between matching molds. Early in 1949, when only open mold procedures were in use, the Bureau of Ships initiated a program to determine the best injection method, the proper amount of vacuum and pressure to apply, the best way to seal the molds to prevent resin leakage, and the times and temperatures to use in the molding operation involved in producing plastic wherries.

Plastic Jigs Used

One of the steps taken to speed up production in "Operation Plastic Boat" was the decision to use plastic jigs instead of the actual molds for laying-up the mat, thereby freeing the molds for performing actual molding operations.

During the past year, Puget Sound Naval Shipyard has increased its production rate from one boat a week to one a day. The finished boats meet the Bureau of Ships' original request for a strong and durable boat which would be easy to maintain. The fact that the color is molded-in makes periodic repainting unnecessary. There are, of course, no seams to leak or caulk.

In the plastic wherry, Styrofoam is used instead of cork as a flotation material. Blocks of the necessary shape are cut from the expanded polystyrene board material and are layer-wedged under the thwarts. The use of Styrofoam is also a factor in the ease of maintenance of the wherries because Styrofoam does not rot as does cork.



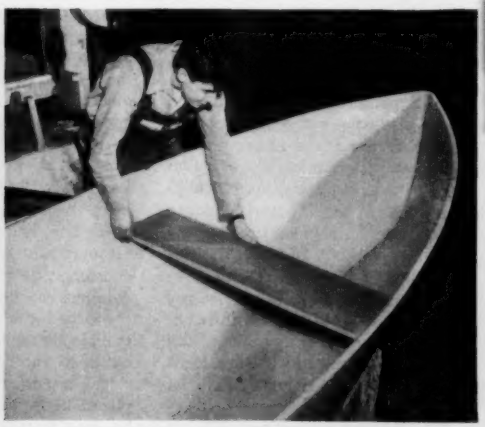
Male portion of mold. Notches or indentations in mold form brackets on inside of finished boat to support the thwarts, which are made of wood



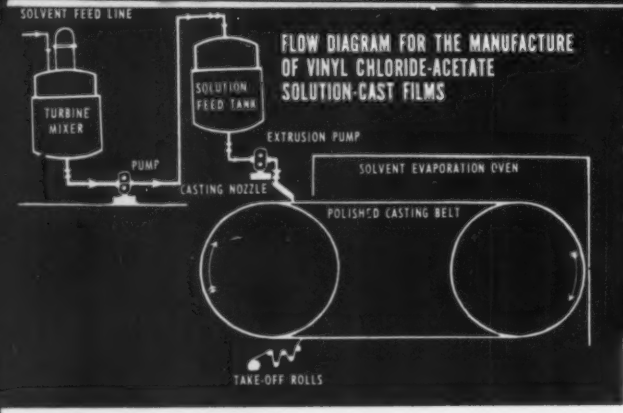
Operator trims glass mat to necessary shape for laying-up. About six or seven layers of mat are necessary to give boat desired strength



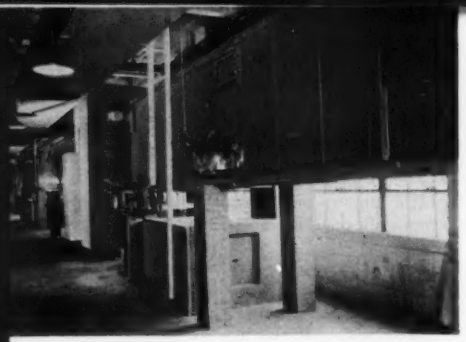
Foamed polystyrene material is cut to desired shape on band saw so that it can be layer-wedged under thwarts in boat. Note lay-up in jig (left)



Thwarts are held firmly in place because they rest on wide brackets which are molded-in as an integral part of the skin of the boat



FLOW DIAGRAM FOR THE MANUFACTURE OF VINYL CHLORIDE-ACETATE SOLUTION-CAST FILMS



Large solvent evaporation ovens, such as the one above, are needed in the manufacture of vinyl solution-cast film

SOLUTION-CAST FILM

. . . is growing in importance. A survey of vinyl chloride-acetate resin solution-cast film—its method of manufacture, its properties, and its applications

by W. J. JEBENS* and HENRY LEE*

PROPERTIES and applications of calendered flexible film and sheeting based on plasticized vinyl chloride and vinyl chloride-acetate resin compositions are relatively well known. The production of these materials has grown tremendously in the past decade, and they now find widespread use in a host of applications such as raincoats, draperies, shower curtains, window shades, inflatable toys, upholstery, and floor coverings (1,2)[1].

On a pound basis, solution-cast, organosol-cast, and plastisol-cast vinyl films are but a minor portion of the total production of vinyl film and sheeting, probably less than 10 percent. However, the cast films are generally manufactured in very low thicknesses (0.001 to 0.002 in.) as contrasted with calendered film (0.004 to 0.008 in.) and sheeting (0.012 to 0.020 in.), and thus, in terms of coverage or yardage, the cast films constitute a significant factor in the industry. These cast films are technically suited for many different fields of applications and are finding their own particular new markets as well as competing for older vinyl film markets; thus their output is expanding rapidly.

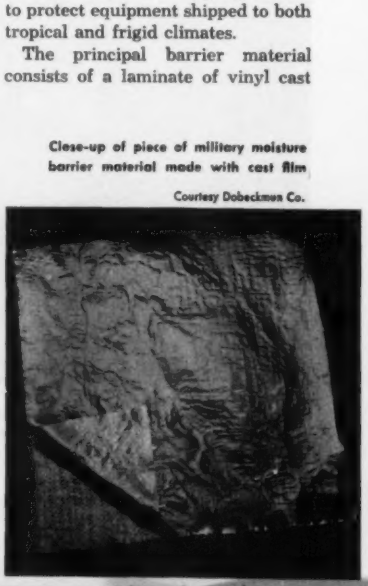
Of these cast films, the solution-cast films are of principal immediate interest, primarily because of two major packaging applications which have been introduced recently. The first such application is the plastic bag for home coloring oleomargarine. In this application, a small bag is fabricated from solution-cast vinyl film by heat sealing, a small capsule of colorant being secured inside the bag by a perforated, heat sealed swatch of cast film. The bag is then filled with oleomargarine and heat sealed. The consumer merely has to pinch the colorant capsule and knead the bag to spread the colorant throughout the oleomargarine. The bag is then cut open and contents removed (3).

The second major packaging application is the military moisture barrier materials described under MIL-B-131 (formerly JAN-P-131), AN-B-20 and similar specifications (4). These barrier materials are used to package aircraft engines and other equipment highly susceptible to rusting and corrosion. These materials, used alone or in conjunction with rigid vinyl plastic windows and moisture-sensitive color indicators to facilitate periodic inspection of the contents, as well as vapor phase inhibitors (5), are being consumed in large quantities to protect equipment shipped to both tropical and frigid climates.

The principal barrier material consists of a laminate of vinyl cast

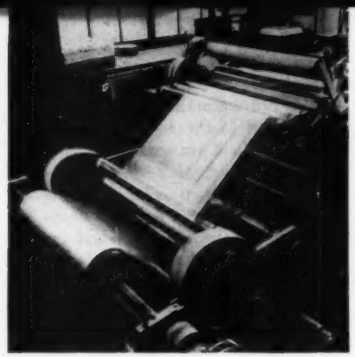
Close-up of piece of military moisture barrier material made with cast film

Courtesy Dobeckmun Co.



* Bakelite Co., Div. of Union Carbide and Carbon Corp.: Development Labs, Bound Brook, N. J., and Technical Service Group, New York, N. Y., respectively.

[1] Numbers in parentheses link to References on p. 194.



After manufacture, cast film can be rewound and slit to width needed for any application

Table I—Typical Cast Film Formulation

	Solution	*Film*	*Solvent*
Non-Volatile:			
1. Vinyl chloride-acetate resin	24.00%	74%	—
2. Di-(2-ethylhexyl) phthalate	8.11%	25%	—
3. Stabilizer	0.32%	1%	—
Solvent:			
1. Methyl ethyl ketone	55.68%	—	75%
2. Toluene	11.89%	—	25%
	100.00%	100.00%	100.00%

film, aluminum foil, polyethylene film, and cotton scrim. The cast film imparts excellent heat sealability, even at high sealing rates, as well as crease resistance and overall toughness to the laminate. The aluminum foil provides virtually absolute water-vapor resistance, the polyethylene improves the low temperature performance, and the cotton scrim provides added mechanical strength to the laminate.

Other growing applications of cast films include rainwear, electrical insulation, furniture covers, head wound gas masks, and oxygen tents. It should be pointed out, however, that at this time military packaging requirements are consuming the bulk of the commercial production of these films, and that only very limited quantities are available for civilian use.

Manufacture

Vinyl chloride-acetate solution-cast films are manufactured by dissolving suitable copolymer resins and plasticizers in synthetic, low boiling solvents, casting or spreading the solution on a highly polished surface or belt, and evaporating the solvents to deposit a tough, clear, thin film. Thickness of the film can be controlled by varying the quantity of solution which is spread onto the casting surface, or, in the case of a moving endless belt, by varying the rate of solution flow and/or varying the speed of the belt drive.

Formulation of solution-cast films is somewhat different from that of calendered films because of the different handling characteristics and properties needed during manufacture and use. Major distinctions are that cast films do not contain fillers and seldom are colored, most production consisting of clear films. However, the principal mechanical property, flexibility, is a function of plasticizer content, as in the case of calendered films, because the solvents used to dissolve the resins before casting are evaporated from the film during its manufacture (6-10). Most commercial cast films generally contain smaller percentages of plasticizers than calendered films to offset the "apparent flexibility" caused by the lower thickness of the cast film.

Typical solvents for vinyl chloride-acetate resins usually consist of mixtures of ketones and aromatic hydrocarbons. Plasticizers are generally esters. A typical formulation for an ester plasticized film is shown in Table I.

Advantages

In general, vinyl plastic cast films are characterized by toughness, high transparency, high tensile strengths and elongations, high tear strengths, outstanding chemical resistance, and a high degree of imperviousness to water-vapor and common gases.

In comparison with calendered films, solution-cast films possess two principal differences of major importance. One, the cast films are generally made in thicknesses of 1

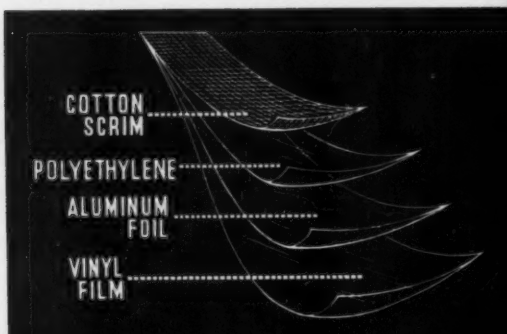
Courtesy Vanant Products, Inc. and D. W. Onan & Sons

Laminate of vinyl cast film and other materials serves as a moisture barrier for overseas shipment of military equipment



Military moisture barrier material consists of vinyl cast film, cotton scrim, polyethylene film, and aluminum foil

Courtesy Dobeckmun Co.





Vinyl cast film is used in oleomargarine package with built-in color capsule

to 2 mils while the calendered films are usually made in 4 and 8 mils, calendering equipment limitations and the mechanical properties desired for the principal applications generally precluding manufacture of calendered films thinner than 4 mils. The second principal distinction is clarity. The solution-cast films are customarily produced on highly polished steel belts which impart high gloss and high clarity. Calendered film is customarily manufactured with a matte surface, the high gloss being undesirable for many fabricated items. It is possible, of course, to produce the cast films with a matte surface also by matting the surface of the belt used to cast the film.

By varying the formulation of cast and calendered films, it is possible to obtain cast and calendered films with somewhat similar properties. However, because of different fields of application, the commercial formulation and properties differ somewhat with the type of film. See Table II.

In comparison with organosol-cast[2] films, the solution-cast films have only a few slight technical advantages, the general properties being very similar. The solution-cast films are slightly stronger (about 2% greater tensile strength) and are characterized by somewhat better heat sealability. However, the organosol films are produced in quantities of about the same order of magnitude of solution-cast films and are also used extensively as a coating material, wherein the organosol is cast directly on the surface (such as cloth or leather) which is to be coated. Today, a large, if not the major portion of the fabrics used in the so-called artificial leather field are coated with organosols or plastisols.

[2] An organsol is a dispersion of a resin in a low boiling solvent, with or without the presence of a plasticizer. A plastisol is a dispersion of a resin in a plasticizer. Dispersions with good flow characteristics can be cast onto polished belts and fused into a continuous film in suitable ovens.

Plastisol[2] casting techniques find their principal use in coatings (such as coatings for work gloves and the fabrics mentioned above) rather than in the manufacture of unsupported film. The high plasticizer content (40 to 50%) needed to produce suitable flow characteristics for casting generally precludes the manufacture of the less elastic, less highly plasticized films suitable for self-supporting film.

Properties

Tear Resistance—Tear resistance, which is of particular interest for packaging as well as many consumer applications, is notably high for solution-cast vinyl films. However, tear resistance is influenced appreciably by manufacturing conditions, formulation, film thickness, and temperature.

Optical Properties—Essentially all di-(2-ethylhexyl) phthalate formulated solution-cast films are very clear. Those with nitrile rubbers as plasticizers generally pos-

Table II—General Comparison of Various Types of Vinyl Plastic Film (Based on Vinyl Chloride-Acetate Resins)

	Solution Cast				
Property	*Unplasticized (0.002 in.)*	*20% DOP[a] plasticized (0.002 in.)*	*25% DOP plasticized (0.002 in.)*	*30% DOP plasticized (0.002 in.)*	*Nitrile rubber plasticized (0.018 in.)*
Clarity	Good	Good	Good	Good	Fair
Specific gravity	1.36	1.29	1.27	1.25	1.21
Tensile strength, p.s.i.	7800	4100	3800	3200	3500
Ultimate elongation, %	5-10	170	250	275	320
Stiffness, p.s.i.					
25° C.	270,000	54,000	6,000	1,200	8,000
10° C.	310,000	140,000	40,000	12,000	55,000
0° C.	340,000	200,000	100,000	46,000	200,000
−20° C.	420,000	300,000	280,000	105,000	400,000
−25° C.	——	——	——	——	——
−50° C.	——	——	——	——	——
Tear strength, g./mil					
0° C.	5	20	30	50	10
25° C.	22	40	350	380	600
Brittleness point, °C.	48	——	−2	−15	−2
Heat sealability	Excellent	Excellent	Excellent	Excellent	Excellent

[a] DOP = di(2-ethylhexyl)phthalate.

sess a tan haze as indicated by the absorption of violet light in light transmission data. Those films manufactured with a matte surface to provide modification of handling characteristics necessarily have lower light transmission.

Permeability—Vinyl cast films have low water-vapor transmission characteristics, but their transmission is significantly higher than that of polyethylene, for example. These cast films also resist the transmission of common gases such as nitrogen, oxygen, and carbon dioxide. The exact transmission characteristics may be varied over a fairly wide range by varied formulation.

Electrical Properties—Vinyl plastic cast films are relatively good electrical insulators and are frequently used for electrical insulating purposes. The high insulation afforded by these strong, lightweight materials provides an ideal solution to the insulation problems inherent in many low-voltage, delicate electrical instruments.

Chemical Resistance—Unplasticized vinyl plastic cast films possess the general characteristics of fused vinyl chloride resins, which are inert to most inorganic chemicals and resist the action of many organic chemicals. Thus, vinyl chloride films resist dilute and concentrated inorganic acids such as sulfuric, nitric, hydrochloric, and hydrofluoric, though sulfuric, anhydrous hydrofluoric, and fuming nitric acid may discolor them some. They resist the action of dilute and concentrated alkalies such as sodium or potassium hydroxide, ammonium hydroxide, caustic soda, and soda ash. They resist aqueous solutions of such corrosive chemicals as iodine, chlorine, bromine, potassium dichromate, silver nitrate, Mercurochrome, and hydrogen peroxide.

Vinyl chloride films also resist many organic chemicals such as alcohols, polyalcohols, gasoline, kerosene, petroleum oils, waxes, fats, and carbon tetrachloride. In general, ketones such as acetone and methyl ethyl ketone are solvents for vinyl chloride films (which allows vinyl chloride resins to be applied as protective surface coatings in a multitude of industrial uses as well as to be dissolved for casting films). Other organic fluids such as esters, acids, aldehydes, and aromatic hydrocarbons swell or soften vinyl chloride films.



Raincoats made of thin cast vinyl film are light in weight, easy to fold up

Plasticized vinyl plastic cast films exhibit the same general chemical inertness as the unplasticized materials, except that in a number of cases their resistance is lowered by the incorporation of the plasticizer.

(*Continued on p. 194*)

Table II—General Comparison of Various Types of Vinyl Plastic Film (Based on Vinyl Chloride-Acetate Resins)—Continued

	Organosol Cast		*Plastisol Cast*		*Calendered*	
Property	*Unplasticized (0.002 in.)*	*25% DOP plasticized (0.002 in.)*	*35+ %, mixed plasticizer*	*50% DOP plasticized*	*General purpose flexible film 30+ % DOP (0.004 in.)*	*Low temperature use film 30+ % plasticized (0.004 in.)*
Clarity	Good	Good	Good	Good	Fair	Fair
Specific gravity	1.37	1.27	1.19	1.16	1.24	1.23
Tensile strength, p.s.i.	7650	3775	2000	1400	3520-2940	2800-2600
Ultimate elongation, %	15-35	215	335	380	233-312	288-309
Stiffness, p.s.i.						
25° C.	—	—	—	315	1,200	1,250
10° C.	—	—	—	—	—	—
0° C.	—	—	—	—	22,000	5,100
—20° C.	—	—	—	—	—	—
—25° C.	—	—	—	—	190,000	38,000
—50° C.	—	—	—	—	430,000	165,000
Tear strength, g./mil						
0° C.	—	—	—	—	—	—
25° C.	22	70	—	—	161-230	125-167
Brittleness point, ° C.	—	—	—62	—45	—28	—50
Heat sealability	Good	Good	Excellent	Excellent	Excellent	Excellent



Photos courtesy The Denominator Co., Inc.

In redesigned counting device (right) with all-plastic parts, styrene cover serves as tabulating key, replacing separate metal key in old model (left). Also modernized is reset knob

Plastics Count Metal Out

PLASTICS have almost completely replaced metal in the Denominator, a compact device designed to keep count of the frequency of any occurrence in business or industry. The device, made by The Denominator Co., Inc., New York, N.Y., now consists of a case, cover, number dials, pawl, and reset knob—all of plastics.

The redesigned Denominator replaces one which had a die cast metal housing and a stamped metal cover. The tabulating key stuck out in front of the unit, and there was a large reset lever like a butterfly nut on the side. When the manufacturer decided to redesign and modernize the tabulator, the possibility of using plastics was investigated.

The new Denominator is a neat, modern-looking unit in which the cover also serves as the tabulating key. The case of the unit is molded of Forticel cellulose propionate[1] or of styrene, and the cover is molded of styrene. The number wheels are molded of white urea and have numbers filled in with black. The reset knob is also molded of Forticel or styrene. The pawl which moves the dial is molded of general purpose phenolic.

The choice of the plastic material for each part was made in cooperation with Waterbury Companies, Inc., Waterbury, Conn., which molds all the plastics components for the Denominator.

In addition to the improved appearance of the new unit, the use of plastics resulted in a number of other advantages. With plastics, it is possible to obtain color in the finished parts without the use of paint or enamel and the color is chip-proof. The use of plastics also decreased the weight of the unit, making it more economical to ship and easier to move when in use.

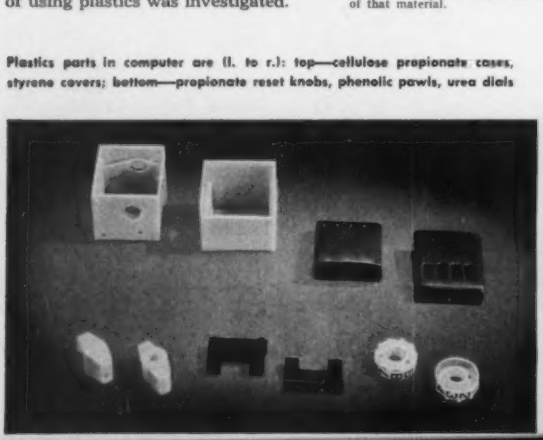
The manufacturer has also found that such plastic parts as the ratchet wheel and the pawl wear better than the metal parts previously used. Finally, the switch to plastics has resulted in savings in the cost of producing the unit.

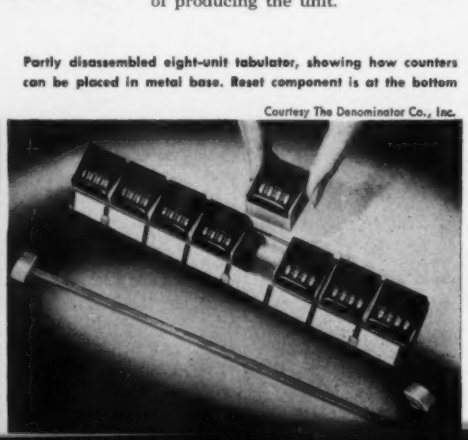
[1] Celanese Corp. of America has discontinued the manufacture of Forticel, but the Denominator parts described here are being molded from an inventory of that material.

Plastics parts in computer are (l. to r.): top—cellulose propionate cases, styrene covers; bottom—propionate reset knobs, phenolic pawls, urea dials

Partly disassembled eight-unit tabulator, showing how counters can be placed in metal base. Reset component is at the bottom

Courtesy The Denominator Co., Inc.





Molded Signs Sell a Name

SKILLFUL use of molded plastics, employed alone or in combination with other materials, is exemplified in a new group of point of purchase displays created and produced for the Blatz Brewing Co. by Thomas A. Schutz Co., Chicago, Ill. An important feature of the display series is the fact that the basic red, gold, and white Blatz oval is included in each piece, giving strong family resemblance and continuity of promotional effort.

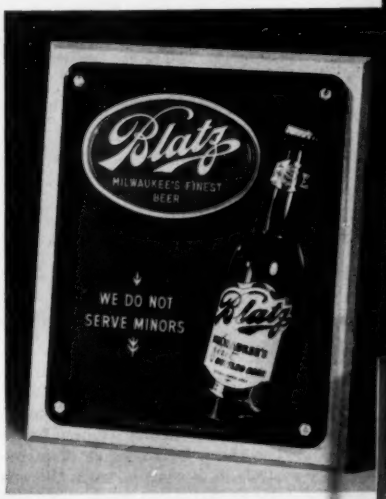
Except for a concealed shadow box on the back of the lighted oval sign, which is molded of black phenolic and sprayed white on the inner surface for greater illumination, the plastic used in all of the displays is styrene. This material is particularly well suited for these pieces because of its light weight, wide color range, ease of molding, and relatively low cost. With ample wall sections throughout, the displays are sturdy, will give long service.

Red, Gold, White

Background for the large oval sign is jet black styrene, with embossed copy in white and trim in gold. Outer edges of the unit flare forward to catch light from the concealed 25-watt bulb. The convex center oval, molded of clear transparent styrene, is finished on the inner side in translucent red, with the embossed lettering in translucent white. The phenolic shadow box is held to the back of this display by means of two knurled brass nuts which are easily removed.

The "no minors" display, made for taverns and other places where beer is served, includes three molded parts—the black rectangular background, the amber half bottle, and the Blatz oval, which is of red styrene with the company name and slogan in embossed white and gold letters. Lettering on the background of this display, as well as the stripe surrounding the oval, is finished in gold. The half bottle, a rigid piece exactly duplicating its glass counterpart, carries the regular paper label and neckband; the crown portion is finished to simulate metal. Four Tinnerman speed clips are used to speed assembly.

For the "On Ice" sign, the simulated ice and rectangular background are integrally molded of clear styrene, the ice being left transparent and the backgound finished in black from the reverse side. The Blatz oval is of red styrene, with embossed lettering finished in white and gold. The "On Tap" sign consists of the styrene oval applied to a wood background finished in limed oak, with simulated wood-burned copy carrying out the feeling of the old wood keg.



Molded styrene parts of sign are black background, amber half bottle, red oval



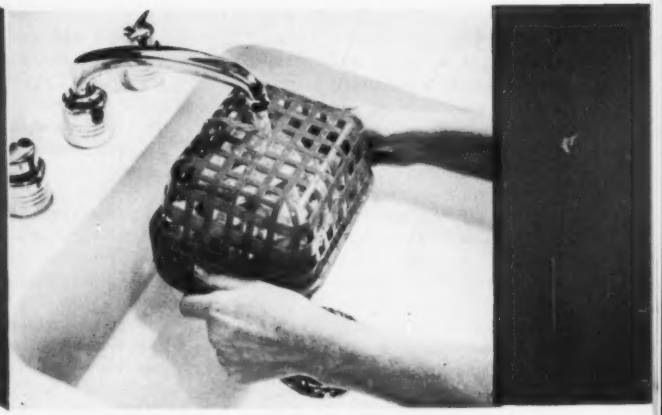
Left: Simulated ice is integrally molded with the styrene background. Right: Red styrene oval with embossed lettering (present on all signs) is set against wood background



In back of styrene oval is concealed shadow box molded of black phenolic



Hat cover fabricated of Vinylite film protects a frail bonnet or fancy hairdo from the rain. The cover, known as the Rainchaser, ties securely in place. It is made with accordian folds so that it can quickly be reduced to the size of a cigarette package for storage in coat pocket or purse. The cover is made in clear vinyl only and has a carrying case of the same material. Made by Renick Boggs & Co., 412 N. Orleans St., Chicago 10, Ill.



Fruits, vegetables, berries, or any food which requires washing can be rinsed easily in the two-part salad washer molded of Lustrex styrene. The food can be placed in the plastic washer and set in the sink with the water running while other tasks are attended to. The styrene washer can also be used to store foods in the refrigerator. Molded by Northeastern Plastics Co., Inc., 588 Commonwealth Ave., Boston, Mass.

PLASTICS

Picnic fork has phenolic handle which also serves as a carrying case for the fork. The brown molded phenolic handle keeps the prongs clean, prevents accidents when the fork is not in use, and serves as a cool, durable handle at the fireside. The fork is 25 in. long when open, 13½ in. when closed. It is made by Midway Products, Inc., Plano, Ill.



Seat-chests are sturdy enough to support 300 lb., can therefore be used as hassocks. But they are hollow and can be used for storage as well—or can be nested to conserve space when they are not in use. The bases and lids are both covered with quilted vinyl film, so the hassocks are washable. The chests are produced in stripes, plaids, and solid colors by Henry A. Enrich & Co., Inc., 6 E. 32 St., New York 16, N. Y.





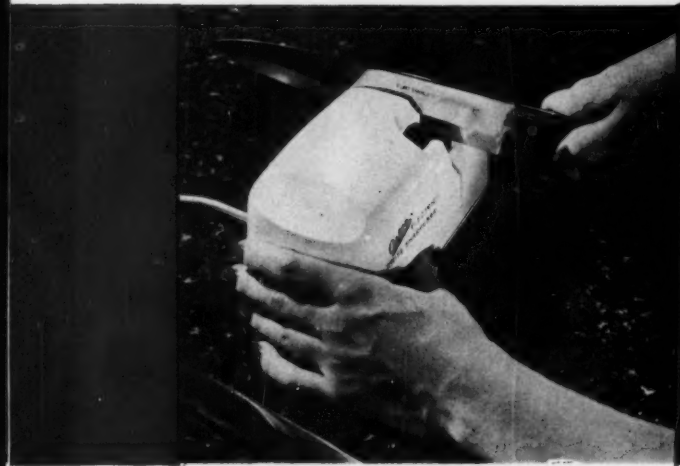
Children's playhouse made of 4-gage vinyl film is 8 ft. long, 4 ft. wide, and 5½ ft. high. It can be used indoors, or can be suspended from the clothes line or from a rope stretched between two trees or posts. Seams are heat sealed. Exterior is decorated with doors, windows, shrubbery. Comes with knock-down wooden frame in carton 4 to 4 by 50 inches. Manufactured by Doughboy Industries, Inc., New Richmond, Wis.



Shuffleboard weight has balanced chrome steel base and colorful top molded of Tenite II cellulose acetate butyrate. The top is molded with a threaded shaft which screws securely into the base. Plastic tops are molded by Boonton Molding Co., Boonton, N. J., for American Shuffleboard Co., 210 Paterson Plank Rd., Union City, N. J.

PRODUCTS

Unique double action of electric knife sharpener quickly puts a factory-sharp edge on any knife, sharpening both sides of the blade at the same time. Gleaming white housing of the sharpener is molded of Hercocel A cellulose acetate, has a finish which will not fade or chip. The housing is molded by Industrial Plastics Co., 3724 W. 38th St., Chicago 32, Ill. John Oster Mfg. Co. Racine, Wis., makes the sharpener.

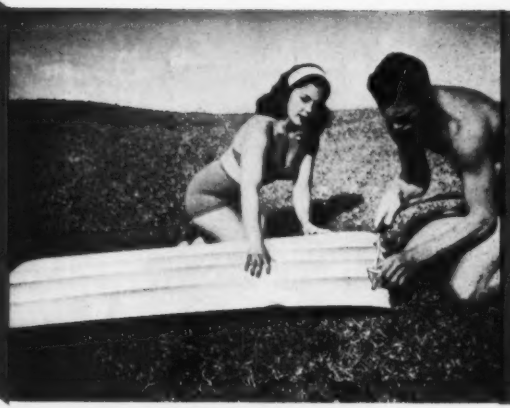


Completely transparent terrarium is molded of styrene, makes an effective container for small plants. It is 12 in. high and 9 in. wide, and can be used on a shelf or hung from the wall. It is molded of Gering styrene by The Emeloid Co., Inc., 1239 Central Ave., Hillside, N. J.





Light weight cleansing tissue dispenser is made of transparent 20-gage vinyl, has zipper closure. The case is flexible, can be folded into the corner of a suitcase, and does not take up unnecessary room when empty. When zipper is closed, tissues cannot fall out or become soiled. The case is made by Lion Mercantile Corp., 13 W. 36 St., New York, N. Y.

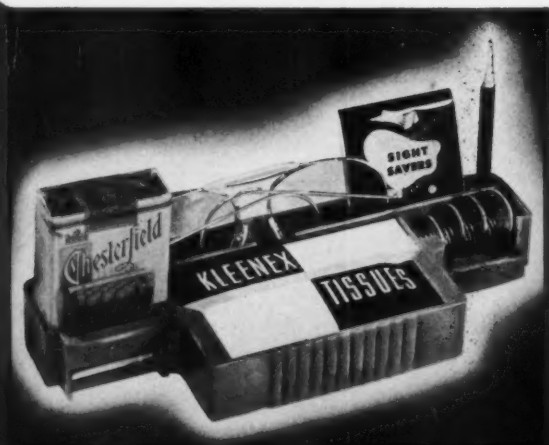


Inflatable mattress made of Vinylite sheeting has a built-in cooling system. It has four water chambers which can be filled with cool water to conduct heat away from the skin of the user. The mattress is 5 ft. by 2 ft. when inflated, and can be used without water if the user desires. Made by Bilnor Corp., 53-06 Grand Ave., Maspeth, L. I., N. Y.

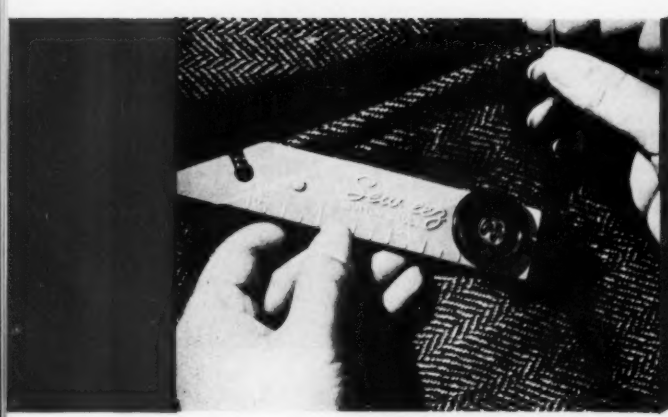
PLASTICS

Lunch box liner molded of white styrene fits into metal lunch box, divides it into three compartments. The two small compartments have a tight-fitting cover which makes them suitable for salads or liquids. The liner is odorless, tasteless, easy to clean, and rustproof. The lunch can be packed in the liner the night before and left in the refrigerator. Liner is made by Sal San Corp., Box 784, Decatur, Ill.





Utility tray molded of styrene is held in place on the dashboard of a car by rubber suction cups. The tray has a metal spring to hold coins for tolls or parking meters, and compartments for cigarettes, matches, pencil, sunglasses, and cleansing tissues. A cut-out slot makes the striking surface of the match pack available for use without removing the pack. Made by Warbern Plastics, Inc., 53 Crosby St., New York, N.Y.



Home sewing aid molded of Bakelite styrene facilitates the job of sewing on buttons. One end can be used to make the shanks of large buttons uniform; the other end is for small buttons. The device can also be used for removing basting threads and forming collar points. It is made by John Dritz & Sons, 1115 Broadway, New York 10, N. Y.

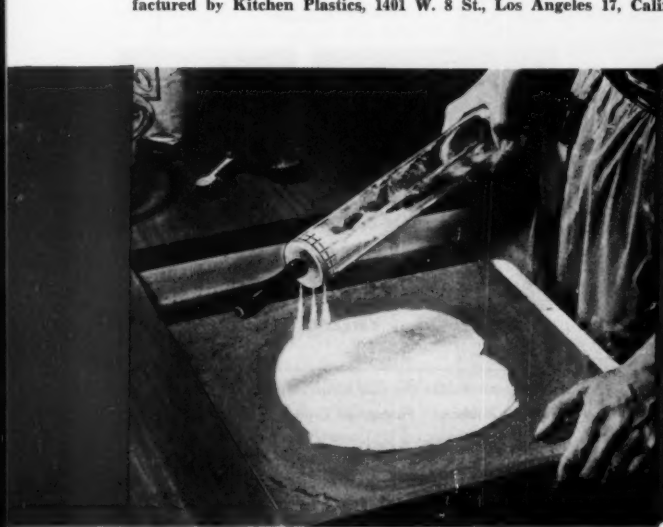


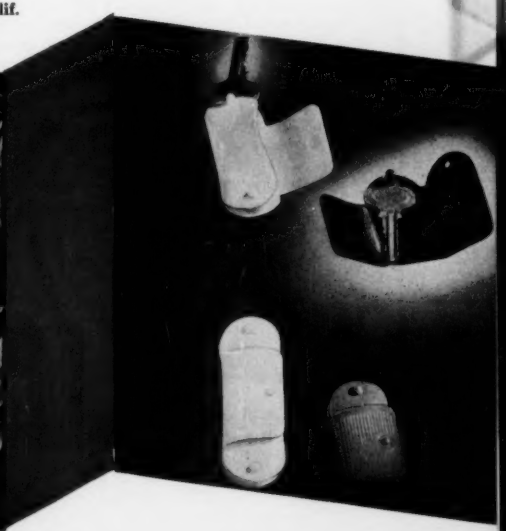
Quart pitcher molded of melamine is designed to match the manufacturer's line of melamine tableware. It is easy to keep clean and is virtually unbreakable. Available in chartreuse, sand, coral, cocoa, green, yellow, gray or blue with or without cover. Manufactured by The Watertown Mfg. Co., Watertown, Conn.

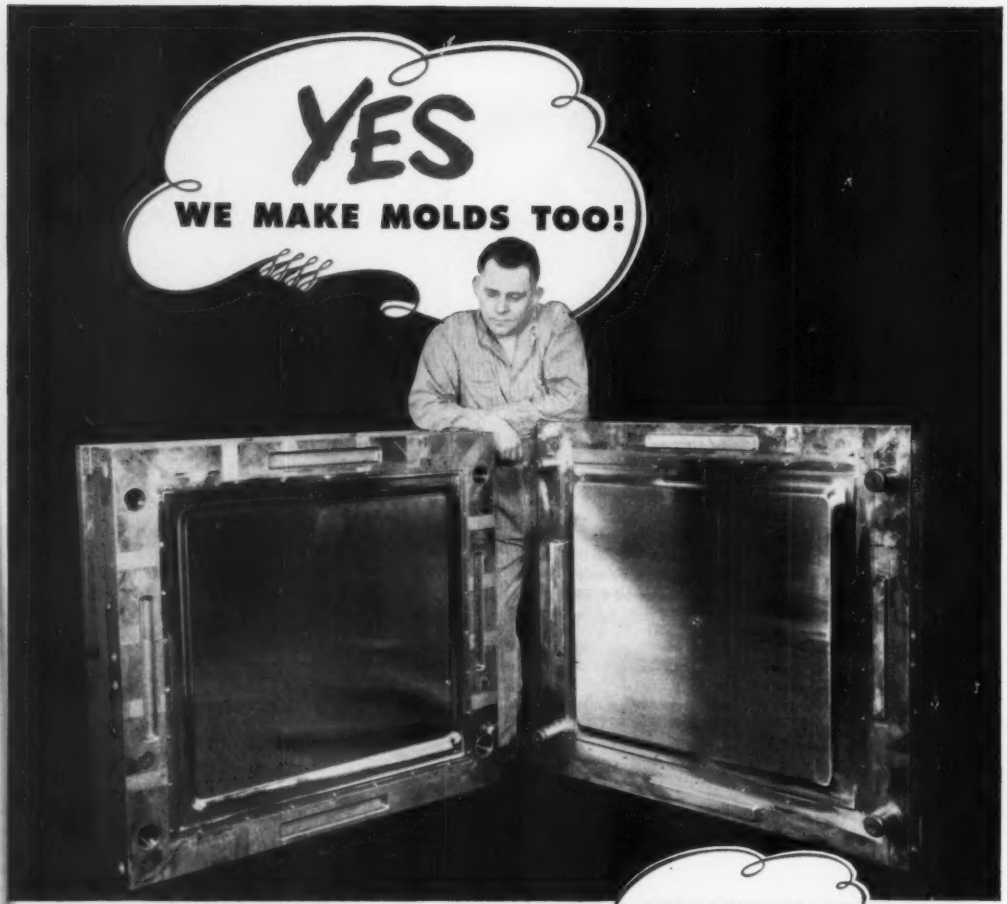
PRODUCTS

Handy one-piece key cases are molded of polyethylene, have no metal parts to come loose or get lost. The keys slip over molded-in pegs and are held firmly in place when the flap is folded over the same pegs and snapped into undercuts in the pegs. Made in two sizes and a wide variety of bright colors by Novo-Plas Mfg. Co., Inc., 275 Front St., Brooklyn, N. Y.

Rolling pin made of Lucite acrylic is hollow, can be filled with flour which can then be sprinkled on the dough as it is needed. Loosening the knurled knob on one end of the cylinder allows the sifting flange to be pulled out so that the flour can be sprinkled on evenly. The supply of flour is always visible through the transparent roller. Manufactured by Kitchen Plastics, 1401 W. 8 St., Los Angeles 17, Calif.



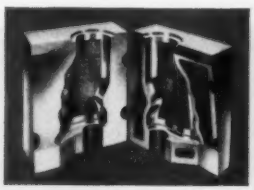




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Liquid Impact Blasting

A time-saver in mold finishing work has also proved useful in maintenance operations. Some recommended uses accompanied by case histories

by B. H. MARKS†

AMONG the newer varieties of equipment which are saving time and money (and making new classes of work possible) in the tool rooms, die shops, and heat treating departments of the plastics industry, few are earning their way more convincingly than liquid impact blasting machines which clean and polish by means of water-borne abrasive streams impelled by air pressure.

Many die makers, heat treaters, contract molders, and manufacturers with their own molding departments, are using the process for three principal purposes: 1) short-cutting hours of hand work in the cleaning and reconditioning of injection and compression molds; 2) pre-polishing new dies both before and after heat treatment; and 3) developing matte textures on molds so that production parts will have new soft sheens.

Description of Process

Liquid blasting is a modified form of impact blasting whereby abrasive is suspended in a liquid, generally water, agitated to maintain suspension, and propelled through a blast gun (Fig. 1) by means of compressed air. The gun is sometimes housed in a cabinet (Fig. 2). Since the abrasive is suspended in the liquid (which may contain a corrosion inhibitor), there is no limit to the fineness of the particles which can be used, but they are generally in the talcum powder range and finer.

Three grades of abrasive are standard and known as No. 100, No. 325, and No. 1250. There is little need for closer gradations of abrasives, and, as a matter of fact, there is considerable discussion as to whether or not there is a perceptible difference in the fineness of finish obtained with the two finer grades (see Fig. 3). The abrasives are natural siliceous minerals, and in the shop seem to be much like chalk.

In mold finishing, wet blasting is superior to dry blasting because: 1) fine dry abrasives tend to pack lightly and flow unevenly; 2) fine dry abrasives naturally create dust, and effective control provision is required; and 3) surface finishes produced by fine dry abrasives are not as smooth as those produced by the same abrasives blasted in suspension with water and projected at the same pressures and volumes.

Most liquid blasting uses the suction feed method (see Fig. 1) or a modification of it in which the

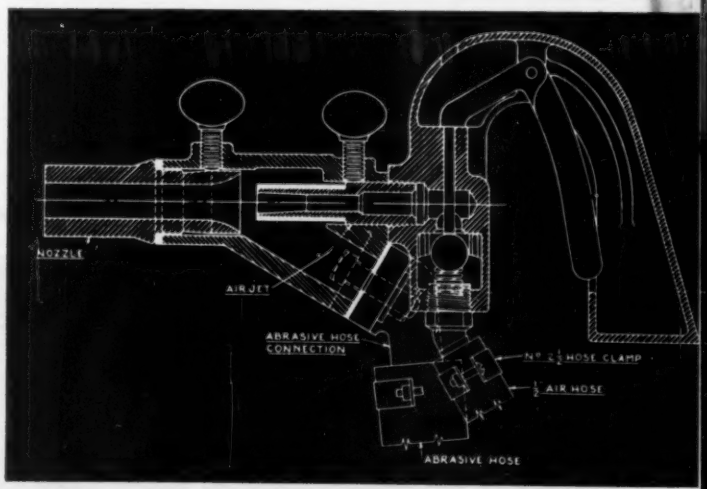


Fig. 1—Suction feed gun for liquid impact blasting. Abrasive slurry, suspended in liquid, is either drawn up into gun by negative pressure or supplied at low positive pressure

* Reg. U. S. Pat. Office.
† Manager, Hydro-Finish Div., Pangborn Corp.

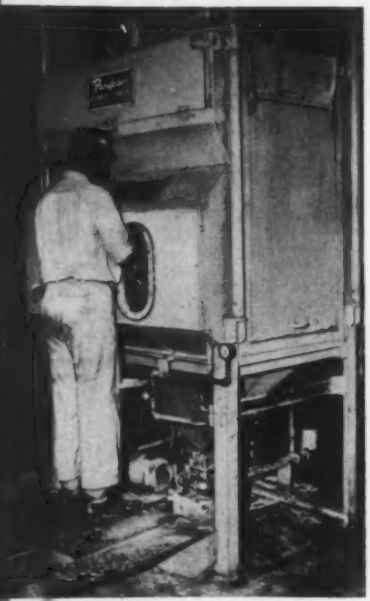


Fig. 2—Cabinet-type blasting machine used for heat treating dies and molds

abrasive is fed to the blast gun at low pressure. The modification gives greater blasting efficiency, since all of the energy of the compressed air is used in propelling the abrasive slurry, and none of it is consumed in lifting the abrasive to the gun. The gun is manipulated in one hand so that the nozzle is within an inch or two of the work, and the abrasive stream strikes the work at an angle of between 60 and 90°. Flatter angles of abrasive impact can be used to reach recesses and awkward surfaces with corresponding sacrifices in polishing speed.

Uses of Process

Liquid blasting is most generally adaptable in the tool room for the following uses: 1) removing and blending directional grinding lines; 2) removing oxides and discolorations due to heat treating; 3) improving lubrication retention; 4) preparing surfaces for electroplating; and 5) easy, fast mold maintenance without the necessity for disassembly.

In the making of a new mold it is well to do as much polishing as possible before hardening, then liquid blast to remove and blend the grinding and directional polishing lines left on the surface. In injection molding, it is necessary for the plastic material to travel over the die surface in a direction perpendicular to the machining and polishing lines. Liquid impact blasting significantly reduces such resistance to flow.

But the biggest single advantage of liquid impact blasting is the case of reaching recesses, corners, details, and surfaces difficult to get at by hand methods. Liquid impact blasting thus offers die surface improvement where the best that could be formerly done was merely "a lick and a promise."

The finish obtained by liquid blasting is a function of the finish before blasting. Liquid blasting will not make a rough ground piece smooth enough to do the work of a finished ground piece. A good die can be made better by proper blasting, but little can be done to improve a badly finished, malfunctioning die. Also, liquid blasting should not be thought of as a tool for producing a given dimension. All parts should be finished to dimension before blasting, then blasted with an abrasive fine enough to hold that dimension.

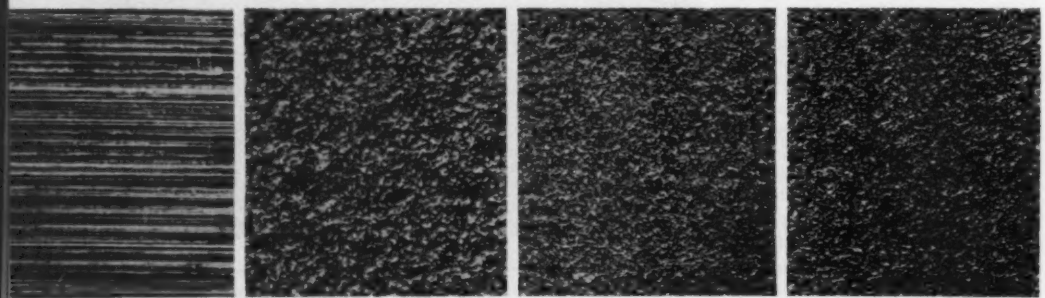
The usefulness of liquid blasting to remove oxides developed by hardening is dramatically evident in a Chicago case history which shows that 16 man-hr. of labor in hand polishing 16 small inserts were reduced to less than 1 hr. by liquid blasting. The cavity was about ¾ in. deep with a diameter varying from ⅜ to ½ inch.

Although the writer expresses no opinion as to the advantages of hard chrome plating, the following improvements in the plating job are reported: 1) the removal of grinding fuzz so that plating adheres only to base metal; 2) less plating build-up around corners and sharp edges; and 3) the same advantages in conditioning the plated surface as discussed for unplated surfaces.

In the writer's opinion, the maintenance of dies and molds after they are placed in service is every bit as important as new mold manufacture. This is especially so where molds operate at high temperatures. There is nothing more disheartening than to see a once beautifully finished mold in the hands of a cleaning room man who is likely to attack the problem of removing carbon from a 10 microinch surface with the first rasp or scraper available. Liquid blasting has been invaluable in this connection. Further, because such fine abrasives are used, repeated cleaning can be ac-

(*Continued on p. 121*)

Fig. 3—Photomicrographs (125 X) show how blasting with various abrasives blends and removes directional grinding lines in steel (left) with #4 grind. Grits used (last three photos) are Nos. 100, 325, 1250. Note small difference in results between two finer grits





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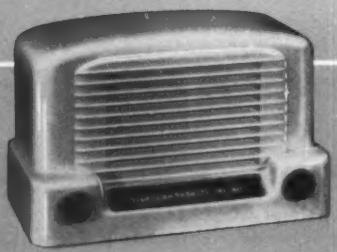
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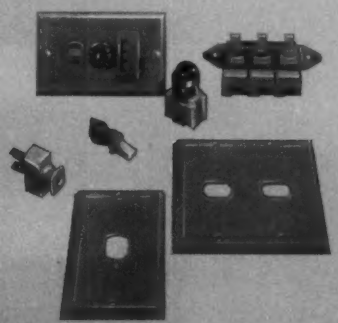






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- Permanent, non-fading, solid colors
- Color uniformity
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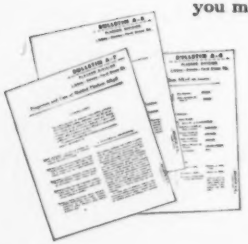
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complished with a minimum of metal removal, and often without the disassembly of articulated or assembled molds.

Although liquid impact blasting is not new in a strict historical sense, it has recently come of age from the standpoint of general usefulness to the plastics industries. Its predecessor was the so-called "mud blasting," long used for sharpening files. And under various trade names equipment for liquid impact blasting as we know it today has been offered for several years to progressive tool rooms. However, only recently has it spread throughout the length and breadth of the plastics industry; and only recently has a sufficient variety of types and sizes of equipment been made available to fit almost any mold shop situation.

The most recent new member of the growing family of equipment for liquid impact blasting is a low-priced model so tiny that it can be picked up bodily by one person and mounted on a bench or set up for operation by a female employee. On the other end of the size scale is enormous, fully-mechanized equipment for heavy polishing schedules (as in the mass production of machinery and automotive parts) far too large for use by the plastics industry.

The equipment most useful in plastics production is the versatile cabinet of the type shown in Fig. 2 which can handle any die which is large enough to be held between two fingers and small enough to be swung into the cabinet by an overhead hoist or rigged into position on rollers.

Experience of Users

Typical of a large manufacturer's usage is the application of liquid impact blasting at The Lionel Corp., Hillside, N.J. Molds for styrene and vinyl parts often require matte finish both for the authentic simulation of flat textures in model railroad items, and for proper "tooth" on exterior surfaces of parts which are to be painted or decorated. Molds for phenolic or styrene parts requiring a very high finish are liquid impact blasted before chrome plating (see Fig. 4). The removal of oxides resulting from the heat treatment of dies is significant, since Lionel heat treats all of its own

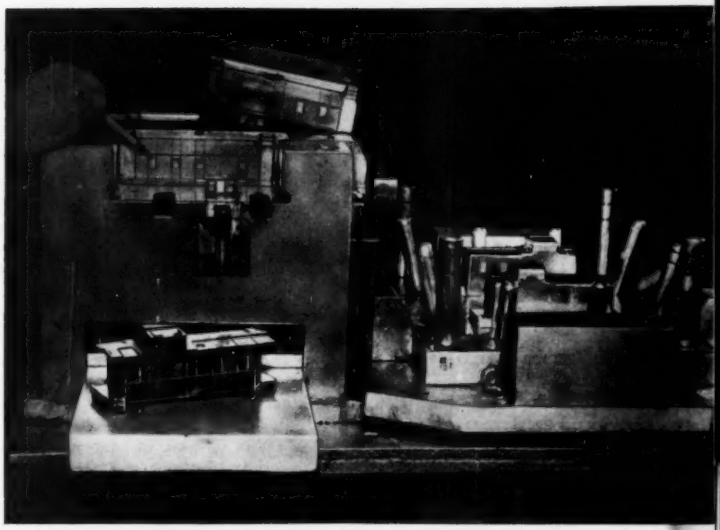


Fig. 4—Liquid impact blasting saves hours of labor in finishing detailed molds. Die (left) for model train caboose is blasted to provide "tooth" for subsequent over-all painting

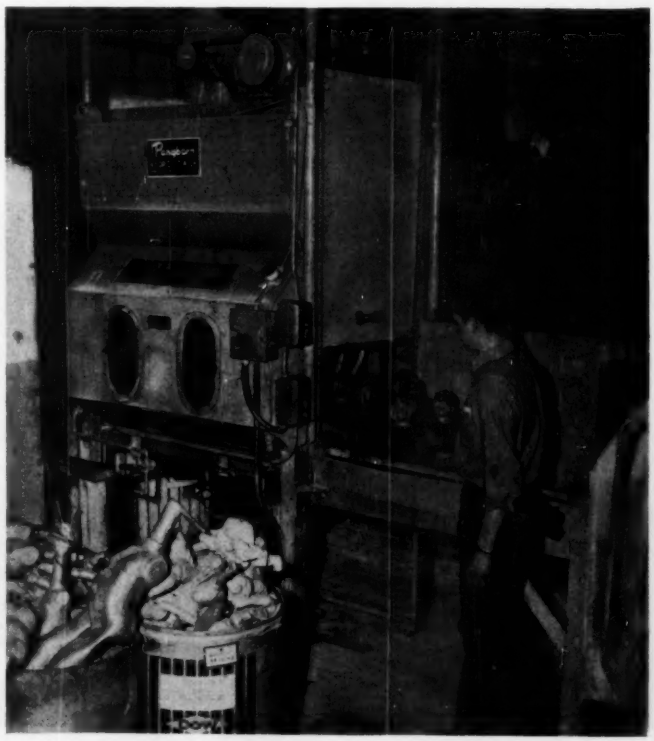


Fig. 5—Interiors of molds for making vinyl doll parts are cleaned by blasting process. Dirty head molds are entering the machine (right); clean body molds are in foreground

molds, whether they are made in its own tool rooms or purchased.

At Hardy Plastics & Chemical Corp., Brooklyn, N.Y., where novelties are produced primarily of acetate and acrylic, liquid impact blasting is useful only in connection with new dies, the molding temperatures and rigors of long service being sufficiently mild to present few maintenance-polishing problems. Although much hand polishing has been eliminated by the use of liquid blasting, it is still necessary to use hand methods on small curved surfaces where the abrasive stream from a liquid blasting nozzle cannot attack from the proper angle. On the other hand, fine recesses and crevices which could not formerly be polished adequately by hand can be quickly and easily treated by the liquid-abrasive stream.

A special, but by no means minor, application of the process is the treatment of die surfaces for doll parts to produce a more skin-like texture on molded heads and arms. Such an operation is performed at Central Toy Mfg. Corp. and at Composition Novelty Co., both of Brooklyn, N.Y. At Ideal Toy Corp., Hollis, N.Y., liquid impact blasting is used to clean out the interior of one-piece head molds in which vinyls are cast. Figure 5 shows dirty head molds being loaded into the blasting machine, and cleaned body molds in the foreground.

Reports from die shops like Sossner Steel Stamps and Mark Kenny Products Co., both of New York, N.Y., reveal that liquid impact blasting saves between 15 and 25% in polishing time after heat treatment, even on the most carefully superfinished work. The process will not replace fine hand work with rouge wheels and diamond dust, but does mechanize most of the removal of oxide scale and foreign matter which is the first step after heat treatment.

Figure 6 shows a cavity retainer plate which carries 100 openings sized to receive small molds for the injection molding of little parts like decorative buttons and other fashion items. Note that the cavity retainer plate carries the usual runners which feed the plastic material to the individual cavities. Liquid blasting has removed all heat treat scale and blended all directional grinding and cutting lines into a homogeneous surface which facilitates the easy flow of the molding materials under pressure. An indication of how much hand labor is saved by impact blasting is the fact that half of this retainer plate was blasted in less than 4 minutes. The hardness of the steel in this case is 51 Rockwell C.

Perhaps few heat treaters supplying the plastics industry have had more experience with liquid impact blasting than Fred Heinzelman & Sons, New York, N.Y. The precise mold shown in Fig. 7 is typical of the quality of work on which Heinzelman finds liquid impact blasting to be of great use. This die (Martempered at 1475°F., quenched in hot salt at 325°F., and drawn to 55 Rc at 625°F.) carries extremely fine engraving, and is used to mold precision electronic components from the not-too-easily handled mineral-filled melamine. According to Heinzelman, the only other way of cleaning this die after heat treating without the expenditure of enormous amounts of hand labor would have been a very delicate acid etch. As it is, the part is ready for use direct from heat treating after 3 minutes of impact blasting.

In a good number of the dies for this user, nothing more need be done after liquid impact blasting, and all hand polishing is eliminated. In other cases, some hand polishing follows the liquid blasting in preparation for chromium plating—in the interest of superfinish work and long die life.



Fig. 6—Cavity retainer plate for small molds, half blasted to show removal of heat treat scale and blending of directional grinding lines in runners

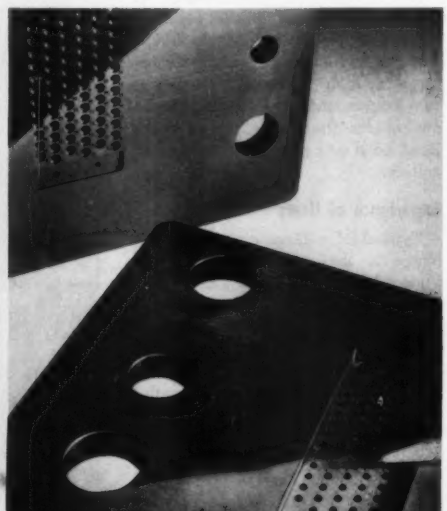
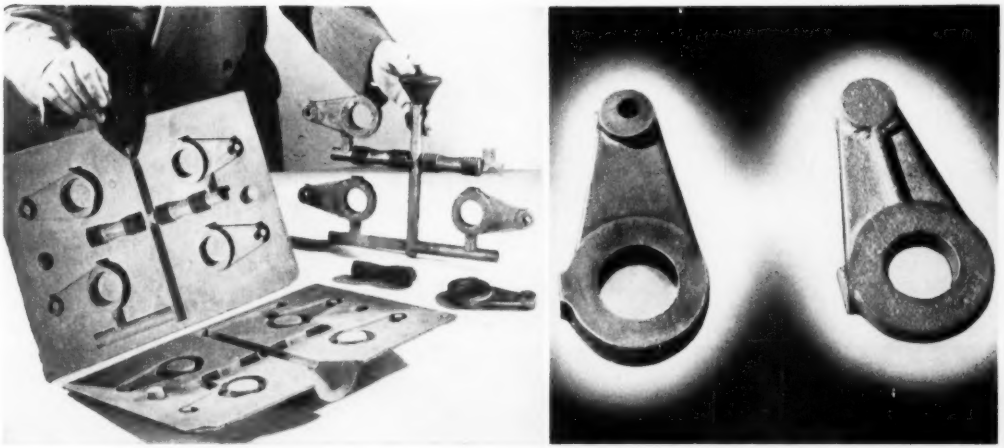


Fig. 7—Half of this die for molding melamine parts has been liquid blasted to show cleaning of minutely detailed engraving



Gray iron connecting rod casting produced in phenolic-bonded sand mold (left) can be drilled, ground, and cleaned in 16 min., which is 7 min. less than the time required for similar piece cast by ordinary sandbox methods. Casting is shown at right after machining

Phenolic-Sand Molds Cut Costs

PHENOLIC-sand foundry molds, described in these pages less than a year ago,[1] have already proved themselves in actual practice. Case histories show that the use of phenolic bonding resins in foundry casting results in the conservation of metal, and a reduction in machining time and costs.

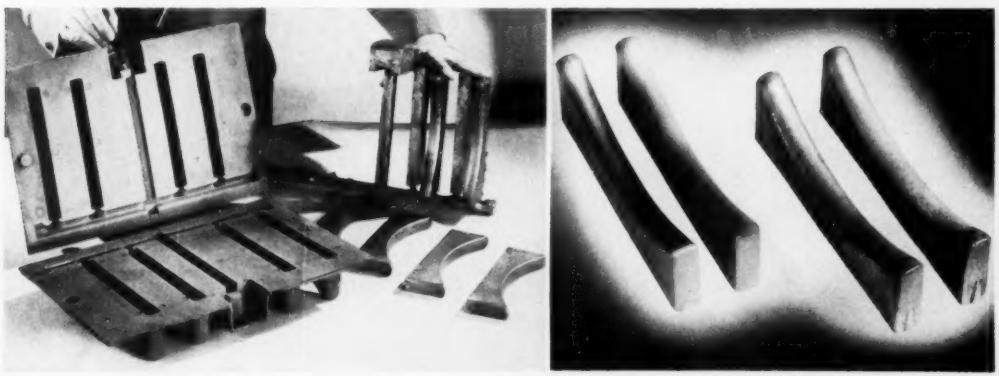
The process employs thin-shell single-use sand molds bonded with phenolic resins coated over a heated metal pattern and then baked hard. The process conserves metal because pieces can be cast to close tolerances (0.002 to 0.003 in. per in.) and because it minimizes the number of rejects.

Builders Iron Foundry, Providence, R.I., furnishes a typical case history to show the reduction in machining time possible when using molds bonded with Bakelite phenolic resin. This company found that a connecting rod cast in phenolic-sand molds could be drilled, ground, and cleaned in 16 min. per piece. This is 7 min. or 30% less time than was required for a similar part cast by ordinary sandbox methods.

The same company found that a crescent thread guide for a textile machine required only 11½ min. for grinding, drilling, cleaning, and finishing. This is 39% less machining time than when cast by ordinary methods.

[1] "Phenolic-Sand Foundry Molds," MODERN PLASTICS 27 (July 1950), 79.

Crescent guides for threads on a textile machine are removed from phenolic-sand foundry mold (left) as rough castings. They can be ground, drilled, cleaned, and polished in 39% less time than is necessary when ordinary casting methods are used to produce them



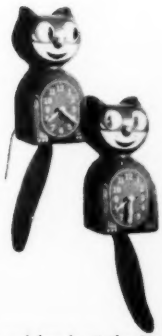
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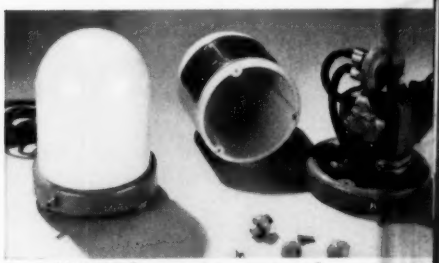
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Shortcuts in Plastics Calculations

by PETER H. SECKEL*

EVERY industry has its own calculating problems. The difficulties in the plastics industry are perhaps more complex because we deal in many different plastics with widely differing specific gravities.

Estimators in plastic plants have frequent occasion to calculate the weight of plastic required in a proposed product. If this piece has never been made before (so the weight can be checked back) a complex calculation has to be done.

It is the purpose of this article to present simplified methods which should reduce the time required to solve certain problems. The results are just as accurate as they would be from long calculations. All that has been done is to reduce the long and involved formulas to simple ones by means of mathematical reductions and by grouping all the constants into one factor. The five formulas described and demonstrated below are summarized in Table I.

Anyone who wants to verify the accuracy of the short formulas will find an explanation of the work in the appendixes.

Weight of Tubes

To calculate the weight (in lb.) per 1000 ft. of a plastic tube, the short formula (see Appendix A) is

$$W = f \times (OD + ID) \times (OD - ID)$$

All that has to be done is to add the outside diameter and the inside diameter, to subtract the inside diameter from the outside diameter, to multiply the resulting figures together, and to multiply by a factor.

The factor varies somewhat for each plastic:

Acetate	f = 452.9
Butyrate	f = 418.8
Methyl meth.	f = 405.2
Ethyl cell.	f = 378.0
Nylon	f = 388.2
Styrene	f = 357.5
Polyethyl.	f = 313.3
Others see Appendix A	

Example: To find the weight per 1000 ft. of a styrene tube, .356 in. OD × .187 in. ID:

$$OD + ID = .543$$
$$OD - ID = .169$$
$$W = f \times .543 \times .169$$
$$f = 357.5$$

$W = 357.5 \times .543 \times .169 = 32.8$ lb./M ft.

We can use this result further. For instance, feet per lb. is just the reciprocal of the lb./M feet. Hence we get $\frac{1000}{32.8} = 30.5$ ft. of this tubing per lb. of styrene.

Or, if we want to determine the weight of 1000 pieces which are, let us say, 4 in. long, all we have to do is to find the total length of 1000 pieces. In this instance 1000 pieces cover 333 feet. We know that 1000 ft. weigh 32.8 lbs. Hence the weight of 333 ft. is $\frac{32.8 \times 333}{1000} =$ 10.93 pounds.

Weight of Rods

To calculate the weight (in lb.) per 1000 ft. of a plastic rod, the short formula (see Appendix B) is

$$W = f \times (OD)^2$$

All that has to be done is to multiply the outside diameter by itself, and to multiply by the above factor.

Example: To find the weight per 1000 ft. of an acetate rod, .600 in. diameter:

$W = f \times (OD)^2$

$f = 452.9$

$W = 452.9 \times (.600)^2 = 163$ lb./M ft.

Weight of Rectangular Sections

To calculate the weight (in lb.) per 1000 ft. of a rectangular plastic section, the short formula (see Appendix C) is

$$W = F \times a \times b$$

All that has to be done is to multiply the width by the thickness, and to multiply by a factor.

The factor varies somewhat for each plastic:

Acetate	F = 576.6
Butyrate	F = 533.2
Methyl meth.	F = 515.9
Ethyl cell.	F = 481.2
Nylon	F = 494.2
Styrene	F = 455.2
Polyethyl.	F = 398.8
Others see Appendix C	

Example: To find the weight per 1000 ft. of a polyethylene belt 2¼ in. wide and 1/16 in. thick:

$W = F \times a \times b$

$= F \times 2.25 \times .0625$

$F = 398.8$

$W = 398.8 \times 2.25 \times .0625 = 56.08$ lb./M ft.

Rectangular Section, Any Length

To calculate the weight (in lb.) per 1000 pieces of a rectangular plastic section of any length, the short formula (see Appendix D) is

$$W = G \times a \times b \times c$$

All that has to be done is to multiply the width by the thickness, then by the length, and then multiply by a factor.

The factor again varies for each plastic:

Acetate	G = 48.05
Butyrate	G = 44.44
Methyl meth.	G = 43.00
Ethyl cell.	G = 40.10
Nylon	G = 41.18
Styrene	G = 37.93
Polyethyl.	G = 33.24
Others see Appendix D	

Example: To find the weight (in lb.) per 1000 pieces of an open 4-sided styrene box of outside dimensions 4 by 6 by 2 inches. The wall thickness all around is 0.050 inch.

We can regard this object as two boxes; namely, a large box (of the outside dimensions) from which a smaller box (of the inside dimensions) has been cut away.

The large box is 4 by 6 by 2 in., and the smaller box is 3.9 by 5.9 by 1.95 inches.

Now using formula $W = G \times a \times b \times c$, we have, for the large box:

$W_L = G \times 4 \times 6 \times 2$

*Asst. Manager, Anchor Plastics Co., Inc., New York, N.Y.

$G = 37.93$

$W_L = 37.93 \times 4 \times 6 \times 2 = 1820.64$ lb.

Similarly, for the smaller box:

$W_S = 37.93 \times 3.9 \times 5.9 \times 1.95 = 1701.90$ lb.

The weight per 1000 boxes will now be the difference in the above results, which is 118.74 lb./M. pieces.

Weight of Any Shape

To calculate the weight (in lb.) per 1000 pieces of any other shape, the short formula (see Appendix E) is

$$W = G \times V$$

In this instance the volume (in cubic inches) of one piece will have to be determined, and the volume then multiplied by the factor. All shapes can be resolved into a variety of cubic, round, and hollow sections, and the volume thus determined.

In the previous example, for instance, we could just as well find the volume of each wall of the box, add the volumes of the constituent sections together, and multiply by the factor.

Appendix A

Weight per 1000 ft. (lb./M ft.) of a tube.

(1) $w_1 = v_1 \times S$ ..... where

w_1 = weight in grams

v_1 = volume in cubic cm. and

S = specific gravity

Now $w_1 = W \times 453.6$ ..... where

W = weight in lb.

Substituting in (1):

$W \times 453.6 = v_1 \times S$, or:

$$(2)\ W = \frac{v_1 \times S}{453.6}$$

Now $v_1 = v_2 \times (2.54)^3$ ..... where

v_2 = volume in cubic inches

Substituting in (2):

$$(3)\ W = \frac{v_2 \times (2.54)^3 \times S}{453.6}$$

Now the volume of a tube is the volume of a rod of the outside diameter, less the volume of a rod of the inside diameter.

(4) Hence $v_2 = v_3 - v_4$ ..... where

v_3 = volume of a rod of OD and

v_4 = volume of a rod of ID

Now the volume of any rod is $\frac{\pi d^2 h}{4}$, where d is the diameter, and h is the length.

Now $h = 12 \times 1000$, since we are determining the weight per 1000 ft.

Hence $v_3 = \frac{\pi OD^2 \times 12{,}000}{4}$, and

$v_4 = \frac{\pi ID^2 \times 12{,}000}{4}$

Substituting in (4):

$$v_2 = \frac{\pi OD^2 \times 12{,}000}{4} - \frac{\pi ID^2 \times 12{,}000}{4}, \text{ or}$$

$v_2 = 3000\ \pi\ (OD^2 - ID^2)$, or

$v_2 = 3000\ \pi\ (OD + ID) \times (OD - ID)$

Substituting in (3):

$$W = \frac{3000\ \pi\ (OD + ID) \times (OD - ID) \times (2.54)^3 \times S}{453.6}$$

$W = 340.5 \times S \times (OD + ID) \times (OD - ID)$, or

(5) $W = f \times (OD + ID) \times (OD - ID)$ .....where $f = 340.5 \times S$

We can now make a chart for various plastics:

Type plastic	Av. S	$340.5 \times S = f$
Acetate	1.33	452.9
Butyrate	1.23	418.8
Methyl meth.	1.19	405.2
Ethyl cell.	1.11	378.0
Nylon	1.14	388.2
Styrene	1.05	357.5
Polyethyl.	0.92	313.3
Vinyl	Variable	*
Phenolic	"	*
Urea formaldehyde	"	*
Others	"	*

*Because of the many formulations and resultant variations in specific gravity, f must be calculated for each of these materials.

(Continued on p. 196)

Table I—Summary of Shortcuts in Calculations

	TUBE	ROD	RECTANGULAR SECTION	RECT. SEC., ANY LENGTH	OTHER
Formula	$W = f \times (OD + ID) \times (OD - ID)$	$W = f \times (\text{diameter})^2$	$W = F \times \text{width} \times \text{thickness}$	$W = G \times \text{width} \times \text{thickness} \times \text{length}$	$W = G \times$ volume of one piece
W will give you.....	lb./M ft.	lb./M ft.	lb./M ft.	lb./M pcs.	lb./M pcs.
Specific gravity	Value of f	Value of f	Value of F	Value of G	Value of G
Acetate (1.33)	452.9	452.9	576.6	48.05	48.05
Butyrate (1.23)	418.8	418.8	533.2	44.44	44.44
Methyl meth. (1.19)	405.2	405.2	515.9	43.00	43.00
Ethyl cell. (1.11)	378.0	378.0	481.2	40.10	40.10
Nylon (1.14)	388.2	388.2	494.2	41.18	41.18
Styrene (1.05)	357.5	357.5	455.2	37.93	37.93
Polyethyl. (0.92)	313.3	313.3	398.8	33.24	33.24
Other materials or other specific gravities	340.5 × sp. gr.	340.5 × sp. gr.	433.52 × sp. gr.	36.127 × sp. gr.	36.127 × sp. gr.



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Formulation Studies of Vinyl Resin Organosols

by G. M. POWELL†, R. W. QUARLES††, C. I. SPESSARD†††, W. H. McKNIGHT††, and T. E. MULLEN†

The successful formulation and use of organosols depend upon achieving a proper balance in the suspending phase between two major types of liquids, called dispersants and diluents. Dispersants are polar liquids which have some true solvent or dispersing action on the resin, while diluents are non-solvents, usually hydrocarbons. Viscosities go through rather pronounced minima as dispersant-diluent ratios are varied. Preferred systems yield lowest viscosities and broadest minimum viscosity ranges.

Where plasticizers such as di-2-ethylhexyl phthalate are desired in the final film, these make very good dispersants, often requiring only the addition of diluents to reach optimum compositions. Among the volatile dispersants, those having relatively mild solvent action on the resin are preferred. Thus, diisobutyl ketone is one of the most satisfactory, but other ketones, esters, and ether-alcohols are useful also. Among the diluents, aromatic hydrocarbons tend to cause some swelling of the resin, while aliphatics do not. Accordingly, blends of aromatic and aliphatic or naphthenic hydrocarbons are frequently used.

ONE of the important outlets for the vinyl chloride-vinyl acetate copolymers is in the field of decorative and protective coatings. This includes the more conventional types of coatings such as baked finishes for washing machines, refrigerator parts, and other manufactured articles, beer can linings, and coatings for other containers and closures, air dried maintenance and general anticorrosive finishes, and many others. In addition, the higher molecular weight resins have found widespread usefulness as tough, flexible coatings for cloth and paper, and for the manufacture of unsupported film.

A relatively recent development, which has contributed much to the rapid increase in use of these resins, especially in the latter categories above, has been the successful development of the organosol technique for applying these coatings. By this method high molecular weight, relatively insoluble types of copolymers are handled as finely divided suspensions or dispersions in mixtures of organic liquids which lack sufficient solvent action to form true solutions. Thus, high solids contents are obtained in relatively inexpensive thinners. After application to a surface, a brief heating cycle is needed in order to drive off the volatile components and to fuse the tiny, thermoplastic particles into strong, coherent films.

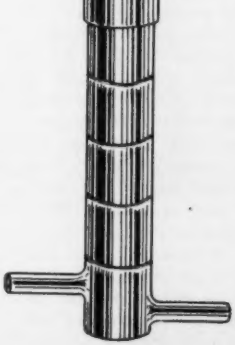
These organosols have been described in a general manner elsewhere by Quarles[1] and Powell and Quarles[2], and have been referred to briefly by others[3,4,5]. It is the purpose of this paper to present some of the detailed formulation studies which have been carried out to obtain the background information so essential to the commercial success of these dispersions.

Dispersion Techniques

The general idea of avoiding the high viscosities inherent in true so-

[1] Quarles, R. W., Can. Chem. & Prod. Ind. *84*, 33-36 (Apr. 1946).
[2] Powell, G. M. and Quarles, R. W., Official Digest *263*, 696 (Dec. 1946).
[3] Patton, C. W., India Rubber World *114*, 223-4 (May 1946).
[4] Hoyt, J., Modern Packaging *19*, 193-262 (Mar. 1946).
[5] Woodcock, W. A., American Paint J. *30*, No. 6B (Convention-at-Home Daily) 10-11, 12 (1945).

Fig. 1—Modified bob for viscometer



* Reg. U. S. Pat. Office
† Carbide and Carbon Chemicals Co., Div. of Union Carbide and Carbon Corp., S. Charleston, W. Va.
†† Mellon Institute, Pittsburgh, Pa.
††† Present address: Bakelite Co., Div. of Union Carbide and Carbon Corp., Los Angeles, Calif. Formerly: Mellon Institute.

lutions of high molecular weight materials by handling them as finely divided suspensions in non-solvent liquids is scarcely new. The naturally-occurring rubber latex is perhaps one of the earliest examples of this. The German technologists and, more recently, many others prepared high polymers by emulsion-polymerization processes and found methods for depositing films from synthetic latices. This technique has been applied to a wide variety of polymeric materials, and many of these are available today in water-dispersed form. In addition, methods were devised for preparing water dispersions and emulsions from massive rubber and plastics,

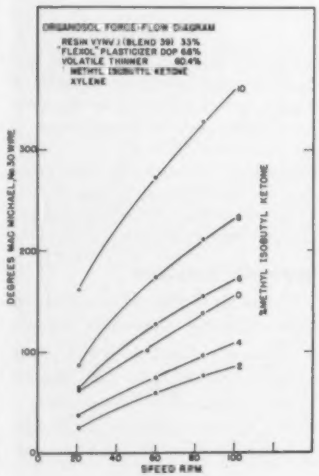


Fig. 2

and the large number of patents in this field attests to the wealth of ideas engendered.

While water has many advantages as a suspending medium, not the least of which are its low cost and non-flammability, it also possesses inherent limitations for many types of applications. Dispersions in organic media, while more expensive, offer greater versatility in evaporation rates, require less heat for drying, and avoid the difficulties of freezing instability, effect on dimensions of paper and cloth, and rusting of iron equipment. Thus, they seem to have greater possibilities in the general surface coatings field.

An early attempt to prepare sus-

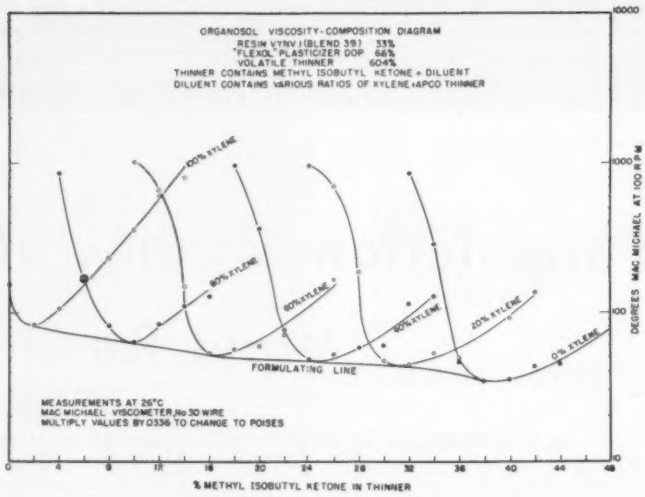


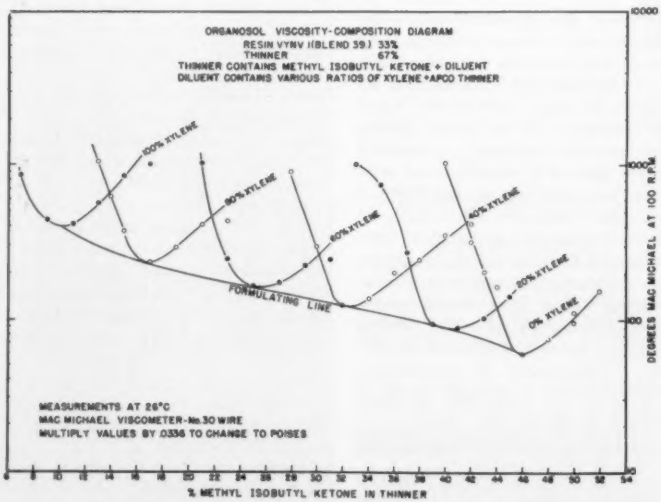
Fig. 3

pensions in organic media was that of Plauson[6], who used mechanical methods of breaking up various natural and synthetic resinous substances to produce the finely divided particles he required. An important commercial development along this line was that of Wakefield and Catlow, who were able to prepare finely divided dispersions, or "gooks," of almost completely reacted phenol-formaldehyde resin varnishes in aromatic hydrocarbons[7]. The particles of these dispersions cohere together well upon air-drying, and they form the basis of extremely fast drying vehicles for metal primers. Without doubt there are many others who would deserve mention also, were an effort to be made to review completely the history of non-aqueous resin suspen-

[6] Plauson, H., U. S. P. 1,436,820 (Nov. 28, 1922).

[7] Catlow, W. R., Jr., Paint Oil & Chem. Rev. *106*, 94-5, 116 (Nov. 4, 1943).

Fig. 4



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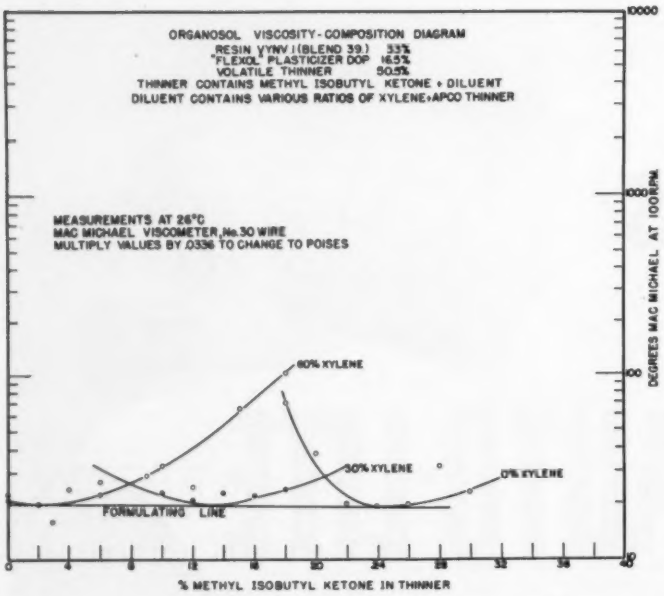


Fig. 5

sions developed for use in coatings.

Early in the development work on the vinyl chloride-vinyl acetate copolymers for coatings applications, the desirability of handling these resins in suspensions rather than in true solutions was recognized. Emulsions and aqueous dispersions were prepared, and some of these were transformed or "flushed" into hydrocarbon media. Various mechanical methods of producing finely divided resin particles were investigated, but the non-aqueous dispersions obtained had relatively poor stability and did not seem to be commercially feasible. Then, it was discovered that better quality dispersions of improved stability could be prepared, provided the suspending phase contained enough polar liquids having a wetting or solvent action on the resin to deflocculate and peptize the dispersions, but not enough actually to dissolve the resin at room temperatures. It was also found that when thinners containing relatively active solvents were used, bulk polymerized high molecular weight resin could be softened enough to permit some actual grinding to be effected in pebble mills, and the resulting dispersions showed merit for coating cloth[8]. The large scale development of the emulsion polymerization process for resin manufacture made available commercial quantities of finely-divided, high molecular weight resin. When it was found that this process could be adjusted to produce a resin which could be de-agglomerated to a considerable extent by simple pebble-milling in a polar-nonpolar liquid blend to produce high solids dispersions of excellent stability, and that strong, tough films could be obtained from these by fusing after application, the organosol process became a commercial reality[9]. Applications were found quickly, especially for applying flexible coatings to paper, cloth[10], and foil, and for casting unsupported film.

It was also found that this finely

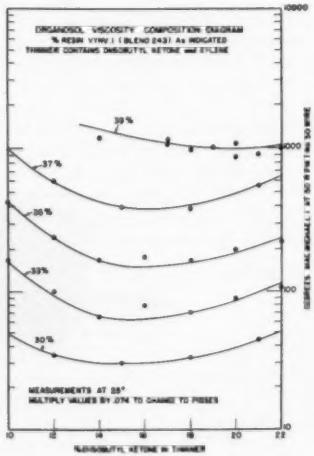
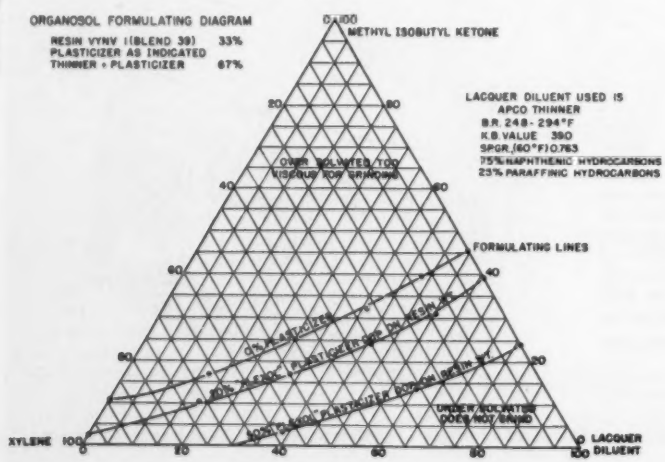


Fig. 7

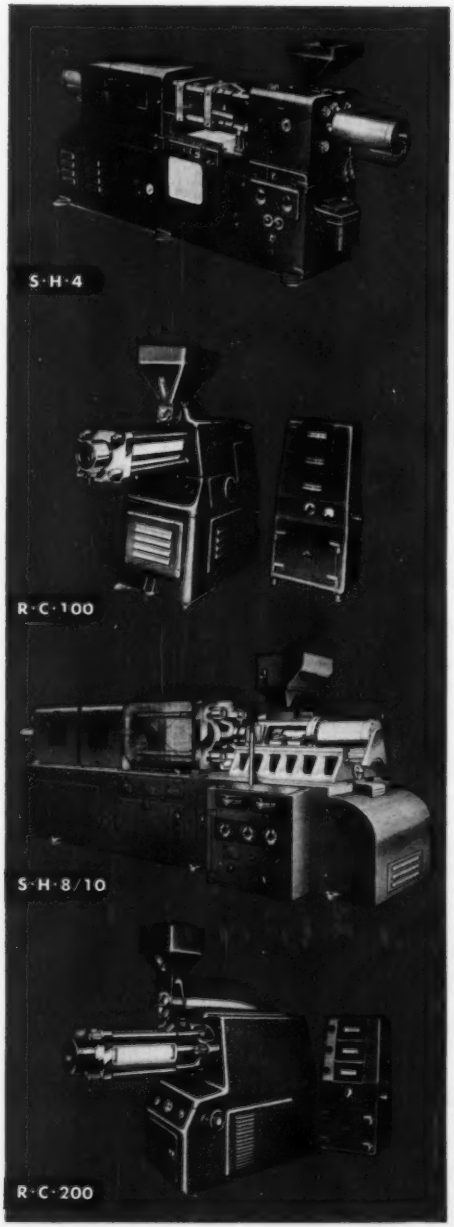
Fig. 6



[8] Spessard, C. I., U. S. P. 2,427,513 (Sept. 16, 1947).

[9] Powell, G. M. and Mullen, T. E., U. S. P. 2,431,078 (Nov. 18, 1947).

[10] "Vinylite Resin Organosols for Cloth Coatings," Carbide and Carbon Chemicals Div., New York, 1944.



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divided resin could be dispersed in certain plasticizers alone to form smooth, fluid pastes without the inclusion of any volatile thinners whatsoever, provided enough plasticizer was used. These plasticizer pastes were limited to mixtures relatively high in plasticizer to resin ratio (above about 8 to 10), but they, too, could be fused to tough, rubbery compositions. They remained fluid but viscous so long as they were kept at room temperature, and could be spread or poured readily. Thus, they offered not only a means of applying coatings without any solvent, but a method for molding articles without using pressure, by a simple casting procedure. These unique materials were given the coined name "plastisols."

A similar development had evidently been taking place in Germany—as revealed after the war by published papers which became available[11] and by reports of special investigators[12]—and in England[13]. They were used abroad first for coating cloth and for making shoe soles, and also for forming articles by dipping or casting methods. In this country plastisols went first into filling the voids between copper strands in electrical cables for underwater service[14], and later into coating cloth, dip-coating, and casting and molding many assorted articles. More recently improved grades of resin requiring less plasticizer and little or no grinding to make fluid pastes have been placed on the market[15], and the usefulness of plastisols is being widened to a considerable extent.

Thus, plastisols represent the special case of organosols where no volatiles are needed. However, to avoid confusion, organosols are defined as resin dispersions containing at least some proportion of readily volatile organic liquids. Plastisols can be thinned to convert them to organosols, and in general it has been found that the same principles apply as regards composition of the liquid phase. The work described in this paper, however, is restricted to organosol compositions prepared as such initially.

[11] Wick, G. and Grasl, J., Kunststoffe *32*, 327 (1942).
[12] Ruebensaal, C. F., FIAT Final Report No. 1072 (PB-77673, "Paste Dispersions of Polyvinyl Chloride," 1947).
[13] Renfrew, A., The Industrial Chemist *19*, 194-8 (1943).
[14] Powell, G. M. and Brister, J. E., U. S. P. 2,427,507 (Sept. 16, 1947).

Fig. 8

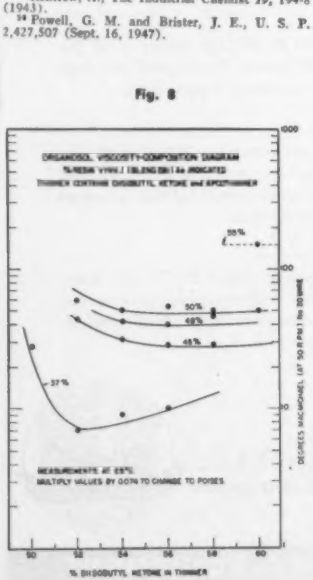
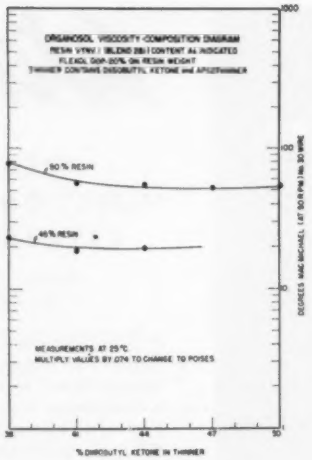


Fig. 9



Formulation of Organosols

The technique that is used today for preparing vinyl resin organosols is relatively simple. It involves charging a special grade of finely divided, high molecular weight, emulsion polymerized, vinyl chloride-vinyl acetate copolymer (see Table I) to a pebble or ball mill, along with the desired proportions of liquid plasticizers, pigments, stabilizers, and the proper amounts of volatile dispersants and diluents, then grinding until adequate dispersion is obtained.

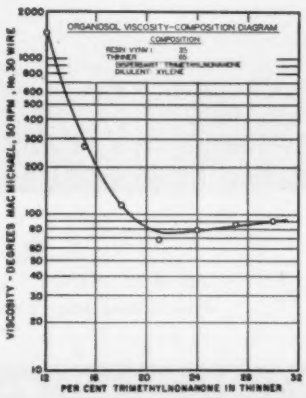
This usually requires 20 to 44 hr. depending upon the milling effectiveness, the particular formulation, and the degree of dispersion desired. Other types of grinding techniques can be used, but they must not generate excessive heat in the resin, for that would cause viscosity to increase abnormally.

Although this is quite straightforward, the formulation of the suspending medium is surprisingly critical and must be done with care if optimum results are to be obtained. With too little dispersant, the viscosities may be so high as to prevent any grinding from taking place, or, at least, the resulting dispersions may tend to flocculate and settle, or exhibit other manifestations of having insufficient peptizing agent. With too much dispersant, viscosities again may be too high and tend to increase still more upon aging. At the optimum composition, dispersions of minimum viscosity are obtained. These also tend to show best flow characteristics, best stability upon aging, and good film-forming properties.

If plasticizers for the resin are desired in the final composition they must be considered in the formulation of the suspending medium, for some of the preferred plasticizers for the vinyl resins serve quite well as dispersants. If plasticizers are omitted, or if the proportion used is insufficient, or if their dispersing action is inadequate, volatile solvents or dispersants must be used in the

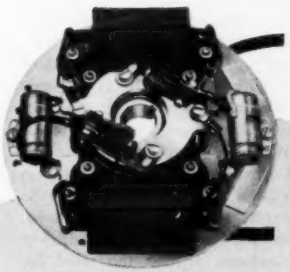
[15] Burleson, M. N., Modern Plastics *24*, 103-111 (Aug. 1947).

Fig. 10



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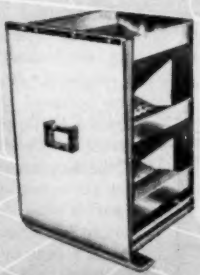


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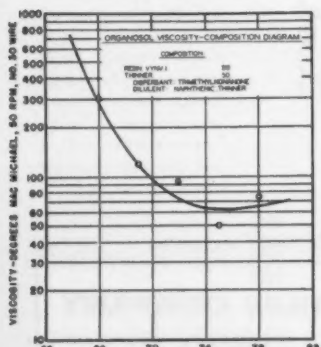
suspending liquid mixture. The various active solvents which can be used for this purpose show varying degrees of effectiveness, so that a knowledge of their performance is important. The hydrocarbon diluents also exhibit differences in behavior; for example, the aromatics have a swelling action on the resin and can be classed as intermediate between the dispersants and the aliphatic diluents. Other factors such as resin solids contents, pigments used, stabilizers added, etc., can also influence the properties of the dispersions obtained.

Thus, early in the development work with organosols it became evident that a systematic study of various dispersant-diluent systems was needed, just as in the development work on vinyl resin solution coatings it had been necessary to carry out viscosity phase diagram studies for various solvent-diluent combinations. It was the need for this general background information which prompted the experimental organosol studies described in this paper.

Experimental Method

Much experimental work was carried out preliminary to this study in order to determine the conditions required for obtaining reproducible results. This involved investigation of grinding conditions such as charging ratios, time, speed, and temperature of grinding. As a result, eight identical "specimen" (1 qt.) size porcelain pebble mills were selected, and these were loaded with identical weights (750 g.) of flint pebbles ½ to 1 in. in diameter, and the covers were fitted with polyvinyl alcohol gaskets (Compar B-1003). A charge of 400 g. of organosol pre-mix was standardized upon, and the mills were rotated at about 46 rpm. for 44 to 46 hr. in a room maintained at 26° ± 2° C. This relatively low rotational speed was selected as a matter of convenience, not for optimum milling rate.

Fig. 11



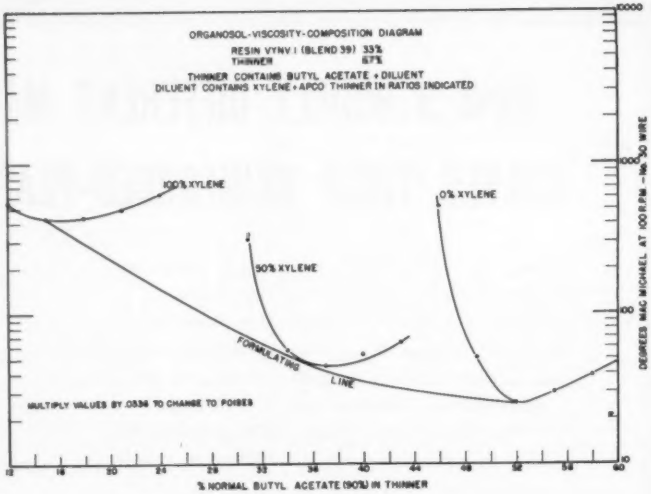


Fig. 12

Since many organosols do not exhibit linear or Newtonian flow characteristics, the simple efflux types of viscometers could not provide adequate characterization of viscosities. Of the then available rotational viscometers, the MacMichael instrument was selected as most satisfactory for measuring viscosities over a range of shear rates. However, with some of the more thixotropic organosols large errors were encountered because of the inability of the instrument to maintain perfect centering of the bob. To avoid these it was found necessary to modify the standard small diameter (1 cm.) bob by brazing two small side arms onto it, as shown in Fig. 1. These arms were ⅛ in. in diameter by ½ in. in length. In addition, a special holder was designed so that standard 8-oz. glass jars could be used to hold the test samples, in place of the cup supplied with the instrument.

In the course of this work, two different MacMichael instruments were used, one with a speed range of 5 to 50 rpm., the other 8 to 110 rpm. A standard viscosity oil was used to calibrate the instruments. The number 30 wire was used as standard, and if other wires were used the readings were converted over to the corresponding values for the number 30 wire. A great convenience, added in later work, was the installation of a revolutions counter (Jaquer's Indicator, H. H. Sticht Co.) which indicated the speed of the cup by counting the number of revolutions in a 3-sec. interval. Without this, speeds had to be determined by the use of a stopwatch.

Immediately after discharge from the pebble mill a portion of each grind was placed in the instrument and deflections were noted for a series of increasing speeds. These measurements were made at about 26° C. The data were plotted as deflections in degrees MacMichael for the number 30 wire against speeds in revolutions per minute. Figure 2

Table I — Properties of Vinylite Resin VYNV.1

Vinyl chloride content	About 96%
Intrinsic viscosity[a]	About 1.5
Heating loss at 135° C.	About 1%

[a]Determined at 20° C. using dilute solutions in cyclohexanone and values extrapolated to zero concentration.



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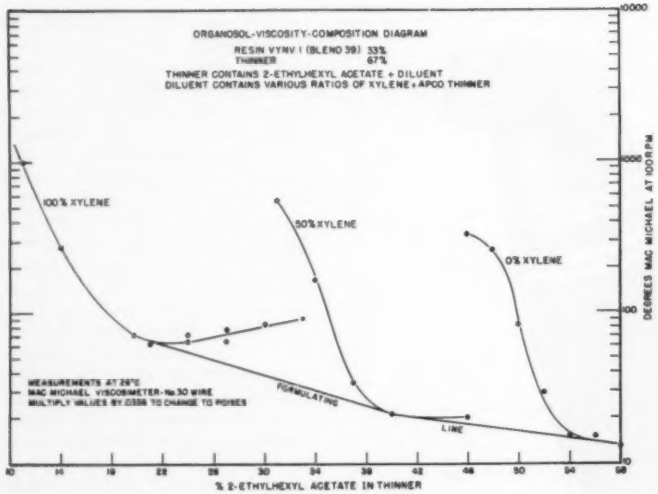


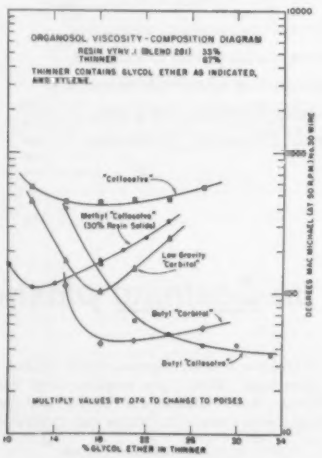
Fig. 13

shows typical curves obtained in this manner. The curves marked 0, 2, 4, 6, 8, and 10 each represent an organosol with that percentage of methyl isobutyl ketone in the volatile thinner. Since the slopes and actual deflections varied in much the same manner, the values of the deflections at one speed, either 50 or 100 rpm., were chosen to represent the viscosity in order to show the effect of changes in compositions more effectively. These were plotted on a semi-log scale in order to encompass the wide range of consistencies often encountered. Figure 3 shows a representative set of results plotted in this manner. The curve at the extreme left represents the same data shown in Fig. 2, while the other curves represent data with blends of xylene and a naphthenic hydrocarbon (Apcothinner). Note that as the proportion of xylene in the hydrocarbon blend is decreased, increasing proportions of methyl isobutyl ketone are required to obtain minimum viscosities.

These fairly sharp viscosity minima, as compositions are varied, are typical of most of these organosol studies. Since compositions in these minimum viscosity zones show most satisfactory coating and film-forming characteristics, the line joining these is referred to as the "formulating" line.

Using this general method, various dispersant-diluent combinations were studied systematically, and the results obtained are presented graphically. Check grinds in each of the mills showed that actual viscosity values could be reproduced within about 10% of the usable range of viscosities. As a precaution, however, all of the grinds in a single series were made at the same time. Commercial grades of solvents, resins, plasticizers, and diluents were used throughout. Initially, individual batches of resin and diluents were set aside for this study, but as this work extended over a period of 4 yr., several batches had to be used. Thus, while the actual values of the viscosity were subject to some variation from this cause, the locations of the points of minimum viscosity and the shapes of the viscosity-composition curves remained substantially constant.

Fig. 14



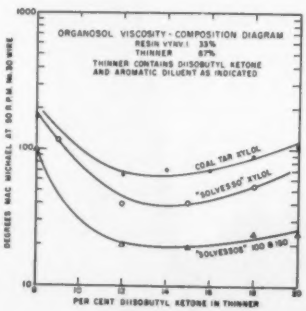
Results of Tests

Figures 2 and 3 present data on organosols containing 20 parts of di-2-ethylhexyl phthalate (Flexol plasticizer DOP) per 100 parts of resin and various amounts of methyl isobutyl ketone. Figure 4 presents data on an unplasticized system, using the same ketone and hydrocarbons. Note that more solvent is required at the optimum viscosity points, and that the viscosity levels are higher and show a greater difference in going from 100 to 0% xylene in the hydrocarbon mixture.

When compositions containing larger proportions of plasticizer are used, viscosity levels are much lower and viscosity minima are less pronounced. This is illustrated by Fig. 5 for methyl isobutyl ketone-xylene-naphthenic hydrocarbon thinners. Thus, it is evident that the DOP plasticizer must serve as a better wetting and dispersing agent for the resin particles than the volatile ketone.

These various formulating lines from Fig. 3, 4, and 5 are plotted on triangular coordinates in Fig. 6. This shows how the amount of methyl isobutyl ketone required drops as plasticizer is added to the composition. Actual calculations show that if the sum of the ketone and plasticizer is used in place of the ketone, the three lines coincide approximately. In the more highly plasticized compositions, balanced organosols can be prepared without any

Fig. 15



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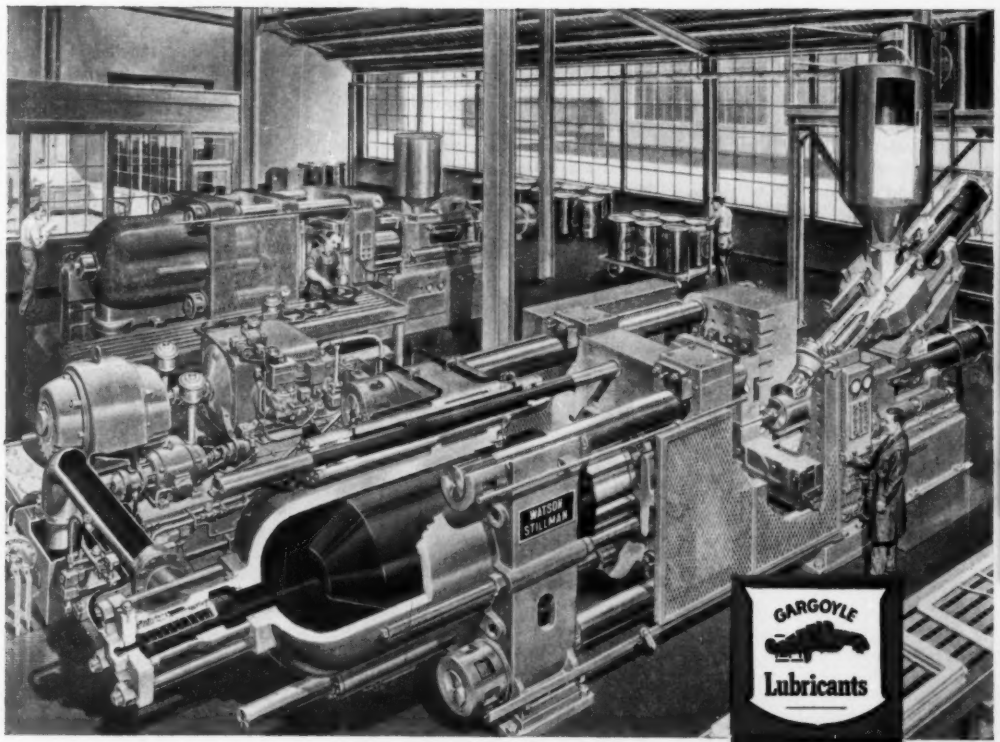
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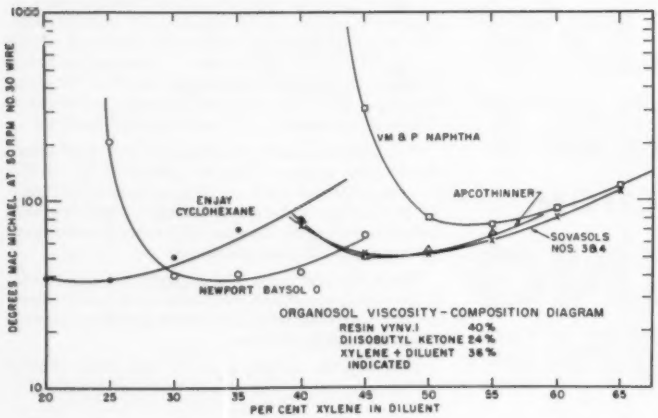


Fig. 16

ketone in the thinner by varying the ratio of aromatic to naphthenic hydrocarbon.

Diisobutyl ketone is a better dispersant than methyl isobutyl ketone, as indicated by the lower viscosity levels and broad optimum viscosity ranges shown in Fig. 7, 8, and 9. Resin contents can be raised well above the 33% shown for all of the preceding charts, especially when naphthenic diluent is used. Data for another very effective dispersant, trimethylnonanone, are shown in Fig. 10 and 11.

The esters can also be used as dispersants. Figure 12 presents data for *n*-butyl acetate (90%), which gives somewhat better results than methyl isobutyl ketone. Wider formulating latitude is shown by 2-ethylhexyl acetate (Fig. 13). Other esters have merit also. Both 2-ethylbutyl acetate and Cellosolve acetate show rather broad viscosity minima, although at slightly higher levels, while methyl amyl acetate is somewhat less effective than butyl acetate.

Results obtained with various glycol ethers, using xylene as diluent, are shown in Fig. 14. These dispersants are often useful for overcoming the adverse effects from traces of water on organosol viscosities. Furthermore, balanced organosol thinners prepared with glycol ethers and xylene are capable of dissolving the solution-coating grades of vinyl chloride-vinyl acetate copolymers, and the addition of these is often helpful in improving adhesion or modifying handling properties of organosols[16].

In the curves discussed above the diluents used have been either xylene or Apcothinner, or mixtures of the two. Other hydrocarbons can also be used. Figures 15 and 16 present data for several other hydrocarbons, using diisobutyl ketone as dispersant. The cycloparaffinics or naphthenics, like cyclohexane, and the terpenes, represented by Baysol O, are the most desirable types. The paraffinic diluents, such as VM & P naphtha, are less desirable, since they require large percentages of dispersants and yield badly flocculated organosols in unbalanced systems. Several of the special lacquer diluents contain proportions of naphthenes, and their properties place them in an intermediate position among the nonaromatic diluents, as shown by results with Apcothinner and the Sovasols, which are typical members of this class.

The better plasticizers for polyvinyl chloride and the vinyl chloride-vinyl acetate copolymers are often excellent dispersants for organosols. The marked reduction in viscosity resulting from the presence of di-2-ethylhexyl phthalate (DOP) has already been mentioned in connection with the data on methyl isobutyl ketone (Fig. 3, 5, and 6). Additional data on plasticizers as dispersants are given in Fig. 17 and 18. Notice that the resin content of these organosols has been raised to 40%. The balance is obtained in these cases by varying the ratio of xylene to Apcothinner in the diluent. Dicapryl phthalate and DOP show very good performance, and tri-2-ethylhexyl phosphate is also quite good. Curve C of Fig. 18, representing tricresyl phosphate, indicates that this is an efficient dispersant, but its viscosity is rather high, presumably because of its strong solvent action on the resin. Many of the other plasticizers that are less effective as dispersants can be used quite satisfactorily in organosols if a little volatile dispersant, such as diisobutyl ketone, is added, but curves of this nature have not been included here.

In this paper emphasis has been placed upon the viscosity of organosols as a function of composition, for information of this type is of primary importance in formulating organosols for specific applications. Film-forming properties and ease of

(*Continued on p. 198*)

Fig. 17

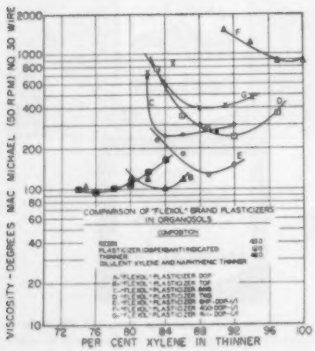
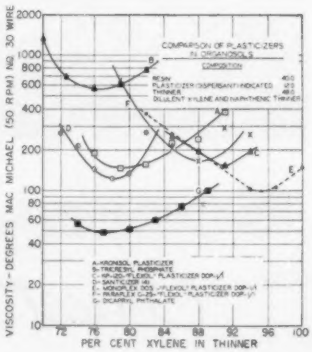


Fig. 18



[16] Quarles, R. W. and Spessard, C. I., U. S. P. 2,461,613 (Feb. 15, 1949).

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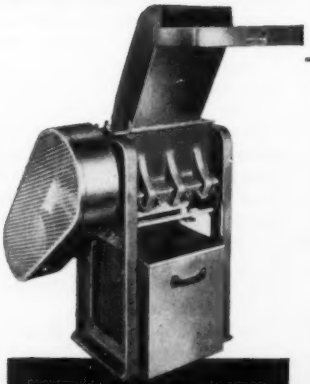
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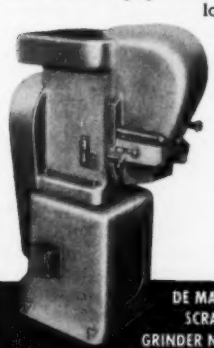
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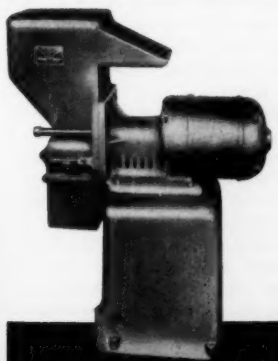
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Polyvinyl Acetal Resins

by NORBERT PLATZER*

Polyvinyl formal is used in lacquers and impregnating materials and for wire insulation. Polyvinyl butyral is employed as the interlayer for safety glass, coating for textiles and paper, and primer for metals. During World War II a plant for the production of polyvinyl acetal was erected in Germany, and the resin was cast into films and used as interlayer for safety glass. This article presents information on the various German methods for preparing these vinyl acetal resins and on their chemical constitution and physical properties.

POLYVINYL acetal resins are made by hydrolyzing polyvinyl acetate[1] to polyvinyl alcohol and reacting the latter[2] with aldehyde in the presence of acid. These two reactions can either be conducted separately or combined.

Processes

Process using sulfuric acid—The oldest method of condensing polyvinyl alcohol with aldehyde is to mix polyvinyl alcohol powder with strong sulfuric acid and the desired aldehyde in a Banbury mixer at room temperature or heated. After a few hours the polyvinyl acetal formed is washed with water and dried. The resin is yellowish and unsuitable for safety glass.

Process using hydrochloric acid—The only process operating on a greater commercial scale in Germany is that for the manufacture of polyvinyl acetal at Hoechst[3]. An 8% solution of polyvinyl alcohol in water is prepared in kettle (A) in Fig. 1, purified with kieselguhr, and filtered through coarse (B) and fine (C) filters. In the acetalizer (G) concentrated hydrochloric acid is added to make up a mixture of 1.1% HCl. The batch is cooled down with brine to 40° F. and mixed under agitation with acetaldehyde, 130% of theory. For the first hour the temperature is kept at 40° F., during the second hour the temperature is gradually raised to 105° F., and for the third hour the temperature is kept at 140° F. to complete the reaction. The process is very sensitive and requires exact control of temperature, time, and concentration, otherwise a difficulty soluble and lumpy resin precipitates. The precipitated acetal is filtered off (H), washed several times with distilled water, and dried at 90 to 100° F. (K). The final product contains 65 to 75% polyvinyl acetal and is soluble in methanol, acetone, and methanol mixed with benzene or chlorinated hydrocarbons.

Polyvinyl butyral is preferred for safety glass owing to its better cold temperature characteristics, but it can not be made in the same way, because a final product of less than 55% butyral results in aqueous hydrochloric acid.

Process using water-insoluble solvents—Without an excess of aldehyde, acetalization may be brought about according to H. Hopff and E. Kuehn[4] by removing the water formed during condensation. This can be carried out either by absorbing the water on a hygroscopic medium or by acetalizing in the presence of a diluent, such as benzene, and distilling off the water with the solvent. For example, 88 parts of polyvinyl alcohol, 300 of methylene chloride, 44 of acetaldehyde, and 0.2 of 85% phosphoric acid are heated to boiling under agitation. A mixture of methylene chloride, water, and, at first, a little acetaldehyde passes over. After cooling the condensed water is separated from the solvent layer which is returned to the reaction vessel. As soon as 18 parts of water are distilled, the reaction is completed. The condensation product dissolves in the methylene chloride. This solution can be used as a lacquer or for coating or film casting, or the solid polyvinyl acetal may be isolated from the solution by distilling off the methylene chloride with live steam.

This procedure is suitable for the manufacture of polyvinyl acetal, but not for polyvinyl butyral. In the latter case the acetalization is incomplete and the final product is insoluble in methylene chloride and contains less than 50% butyral. Other solvents, such as benzene or trichloroethylene, or other catalysts, such as sulfuric or hydrochloric acid, do not result in polyvinyl butyral of high butyral content.

Process using alcohols as solvents—To obtain a soluble polyvinyl butyral of 65 to 80% butyral content, methanol or ethanol is generally employed as the solvent for the condensation. Polyvinyl alcohol (100 parts) is suspended under agitation in absolute methanol, and 4 parts of 50% sulfuric acid and 82 parts of butyraldehyde are added. The temperature is kept between 70 and 90° F. The butyral formed during condensation dissolves in the methanol. The final product is precipitated by adding 30% aqueous methanol. The latter is preferred to pure water to avoid lumpy precipitation. The final product is of fine granular size and

Table I — Cold Resistance of Safety Glass

Interlayer material with 30 parts 3GH per 100 resin	*Temperature of Penetration*	
	Untreated	*Treated*
	°F	°F
Polyvinyl formal	–13	–76
Polyvinyl acetal	–21	–85
Polyvinyl butyral	–40	–105

* Plastics Div., Monsanto Chemical Co.

[1] N. Platzer, MODERN PLASTICS *28*, 113 (Sept. 1950).

[2] N. Platzer, MODERN PLASTICS *28*, 95 (Mar. 1951).

[3] R. E. Richardson, CIOS Report XXVI-11, p. 55; G. M. Kline, CIOS Report XXXIII-23, p. 129.

[4] I. G. Farbenindustrie A.G., G.P. 638,814; B.P. 403,750.

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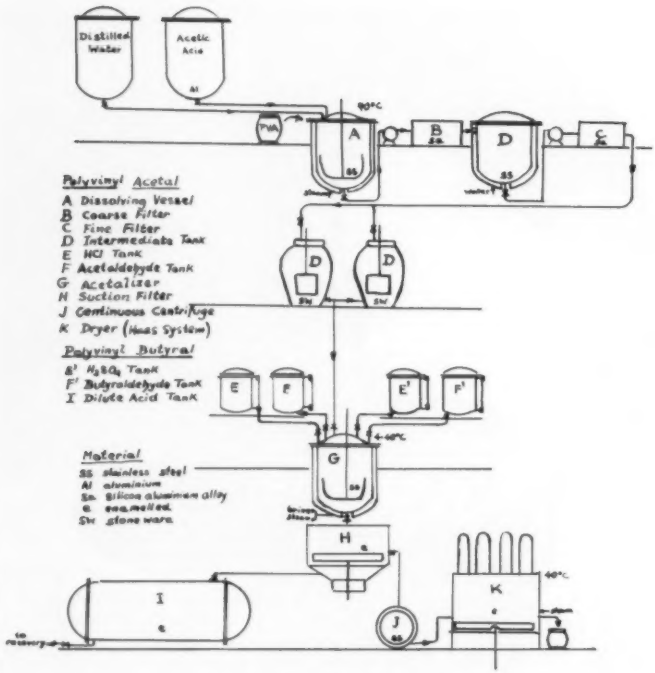


Fig. 1—Manufacture of polyvinyl acetal resins

can be washed free of acid and dried in the normal manner.

The only disadvantage of this method is that the polyvinyl alcohol can only be suspended in methanol, but not dissolved. The limit of solubility of 10% polyvinyl alcohol in aqueous methanol is in a mixture of 65% methanol and 35% water.

A series of condensation reactions has been carried out by varying the methanol-water ratio. In dilute methanol the butyral formed precipitates. The time of precipitation and the degree of acetalization decrease with the dilution of methanol, as is shown in Fig. 2. On the other hand the solubility and the degree of acetalization increase with rising temperature.

Process using acetic acid or solvent—This process, which results in a butyral of fine granular particle size, has been developed and carried out at the Wacker plant in Burghausen. The same equipment shown in Fig. 1 can be used for this process, too. Polyvinyl alcohol (100 parts) is dissolved in 1000 parts of 62% acetic acid under agitation at 195° F. (A). The resulting solution is cooled down to 60° F., and 16½ parts of sulfuric acid and a mixture consisting of 82 parts of butyraldehyde and 425 parts of glacial acetic acid are added while stirring vigorously (G). The temperature is allowed to rise to 95° F. After a few minutes the batch becomes more and more viscous, milky, and, finally, after 20 min., the butyral precipitates in a fine granular size. To complete the precipitation the batch is diluted with water, and the resin is filtered off (H) and washed several times with distilled water free of acid. To the last wash water 1% of pyridine is added to neutralize residual traces of acid. The final product is centrifuged (J) and dried at 100° F. (K).

An analogous process has been employed for making polyvinyl formal using 34 parts of formaldehyde (i.e., 100 parts of commercial formalin) at 140° F.

The advantages of this acetic acid process are the uniform particle size and production of a resin free from tendency to agglomerate. The only drawback is the recovery of the acetic acid. The filtrate has to be separated into nonreacted butyraldehyde, acetic acid, and sulfuric acid. The weak acetic acid is distilled and concentrated by extraction with a mixture consisting of 85% ethyl acetate and 15% benzene.

To avoid the troublesome regeneration of acetic acid, the procedure has been modified to use weak acetic acid. In contrast to methanol, it was found that butyral of almost equal acetal content is formed in solutions of varying acetic acid concentration between 5 and 70% (Fig. 3). In methanol a gradual rise of acetal content with concentration is observed whereas in diluted acetic acid a great break in the curve is found at 5% acetic acid. By working in such a low concentration the filtrate may be discarded or can be reused so that only the quantity of acetic acid absorbed in the precipitated resin has to be replaced. It is advisable to keep the temperature during acetalization fairly low and to stir vigorously, otherwise the butyral precipitates too quickly and is nonhomogenous. The optimum temperature has been found to be between 50 and 70° F. At lower temperatures the initial 10% polyvinyl alcohol solution is too viscous, and a lower concentration has to be used, making the process less economical.

This modified procedure can be carried out as follows: 100 parts of polyvinyl alcohol are dissolved in a mixture of 90 parts acetic acid and 810 parts of water. The solution is cooled to 50° F. in the reaction vessel and 16½ parts of sulfuric acid and 82 parts of butyraldehyde are added while stirring vigorously. The batch becomes more and more viscous, and after 4 min. the resin precipitates in a fine granular size. It is filtered off and the filtrate is reused again. The resin is washed free of acid, stabilized, and dried in the usual manner.

Processes using other acids as catalyst—In aqueous solution free of organic solvents, condensation of polyvinyl alcohol is possible with acetaldehyde by employing hydrochloric acid as catalyst, but the condensation is inefficient with butyraldehyde. To meet the required butyral content of 70 to 80%, sulfuric acid can be employed at elevated temperatures.[5] But this procedure results in a yellowish discolored

[5] E. I. du Pont de Nemours and Co., Inc., B. P. 403,750.



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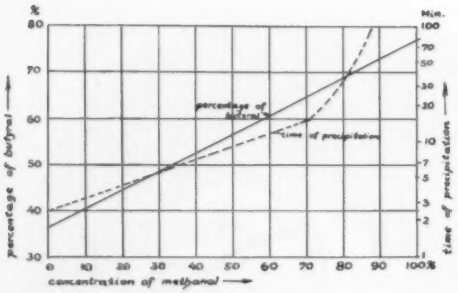
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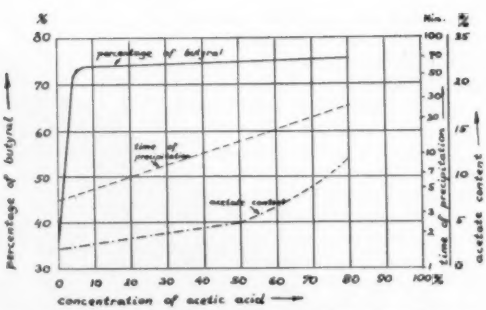
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Effect of type and concentration of solvent on composition of polyvinyl butyral. Fig. 2 (left) methanol; Fig. 3 (right) acetic acid

product. Benzene sulfonic acid can be used in connection with organic solvents. Phosphoric acid can be employed in water-insoluble solvents[4] as well as in aqueous solutions. Polyvinyl alcohol (100 parts) is dissolved in 850 parts of water, cooled to 50° F., and 50 parts of phosphoric acid and 82 parts of butyraldehyde are added. After 10 min. vigorous agitation at 50° F. the resin precipitates in a fine granular condition.

Using sulfuric acid as catalyst, the precipitated resin when used for safety glass has to be washed with distilled water or softened water to prevent formation of calcium sulfate. In the phosphoric acid process ordinary water may be employed. Considering the omission of distilled water and any organic solvent, this last process appears as the cheapest one starting from polyvinyl alcohol, but not from polyvinyl acetate because the hydrolysis would take too much time. Other catalysts, such as zinc or aluminum chloride have been tried, but did not show any improvement.

Another method of producing polyvinyl acetal resins is by hydrolyzing polyvinyl esters and by acetalizing during or after the hydrolysis without separating the intermediate polyvinyl alcohol.

Polyvinyl acetal from vinyl acetate monomer or polymer in alcohol solution—For applications such as lacquers, textile coating, and hat stiffening, slight discoloration and less transparency may be allowed. Such solutions of polyvinyl acetal in methanol or ethanol are made at Burghausen by using vinyl acetate monomer or polymer as the starting material. The whole process is carried out in one kettle without separating the intermediates, as follows: 650 kg. of vinyl acetate are heated with 200 kg. of methanol or ethanol and 0.1% of dibenzoyl peroxide as catalyst in an enamelled kettle with stirring at 650° F. for 7 to 8 hr. until reflux ceases. The batch of polyvinyl acetate is diluted with 350 kg. of methanol, cooled to room temperature, and mixed with 1.8 kg. of concentrated sulfuric acid in 20 kg. of methanol added in small quantities during 2 hours. When heated up to reflux temperature, hydrolysis takes place, and the polyvinyl alcohol precipitates in fine particles. After 6 to 8 hr. the batch is cooled again and mixed with 130 kg. of acetaldehyde. To complete the acetalization the mixture is heated up until a clear solution occurs. The batch is neutralized with caustic and diluted with methanol or ethanol to 50% solids. Instead of acetaldehyde, a mixture of 3 parts acetaldehyde and 1 part of diethyl acetaldehyde may be used. The final product is yellowish and cannot be used as interlayer for safety glass.

Polyvinyl butyral from polyvinyl acetate emulsion—The procedure described above in which acetic acid is used as the solvent can be considerably simplified by using polyvinyl acetate emulsion as the starting material, as follows: 100 parts of polyvinyl acetate emulsion (containing 60% polyvinyl acetate, 5% polyvinyl alcohol as emulsifier, and 35% water) are diluted with 100 parts of 10% sulfuric acid and hydrolyzed at 140° F. After 2 hr. the emulsion changes into a clear solution. A sample is taken and titrated with N/1 sodium hydroxide and methyl orange and phenolphthalein to determine the degree of hydrolysis. In less than 24 hr. the hydrolysis is complete and solution of polyvinyl alcohol with 3% acetate content results. The solution is cooled and diluted with 200 parts of distilled water to get the required concentration of 9% polyvinyl alcohol, 7¼% acetic acid, and 2½% sulfuric acid. By adding 31 parts of butyraldehyde the condensation can be carried out as described in the section above.

Chemical Constitution

The characteristics of polyvinyl acetal resins depend primarily on 1) the polymerization level of the polyvinyl acetate used, 2) the extent to which the polyvinyl acetate has been hydrolyzed, 3) the choice of the aldehyde used, and 4) the number of hydroxyl groups acetalized. Besides these factors, the catalyst used and the manufacturing conditions, such as solvent (see Fig. 2 and 3), temperature, neutralization, and stabilization, influence the properties of the final product.

Polyvinyl butyral, as used for the manufacture of safety glass, contains 18 to 20% of polyvinyl alcohol and 1 to 2% of polyvinyl acetate. The remaining percentage has not been analyzed before and has been considered to be polyvinyl butyral. The reason for this was the difficulty in determining the acetal content by analysis. The polyvinyl acetate content is easily determinable by the standard saponification method and the polyvinyl alcohol content according to the method of Verley-Boelsing[6] in a mixture of acetic anhydride and pyridine. It was finally found that the acetal content can be determined in two different ways: 1) decompose the resin with mineral acid, steam distill the free aldehyde, and react the latter with aqueous

[6] Verley-Boelsing, Berichte *34*, 3354, 3359 (1901).

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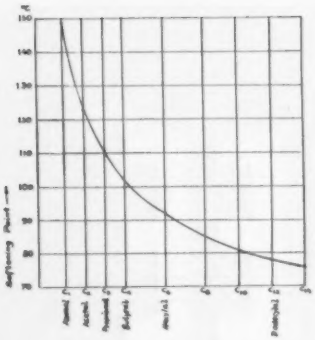


Fig. 4—Softening point for a series of different aliphatic acetal resins

hydroxylamine salt solution; or 2) reflux an alcoholic solution of the resin with alcoholic hydroxylamine hydrochloride solution and gradually add water[7]. The first method can be employed for polyvinyl formal, acetal, and butyral. The second method is only suitable for butyral, but may be preferred for this resin, being simpler and applicable without interference by plasticizer. The percentages of polyvinyl acetal, alcohol, and acetate do not total 100%. The difference is of the order of 2 to 4% and is due to loss of hydroxyl groups by the formation of ether linkages and of double bonds.

The number of double bonds can be analyzed in a modified way as described by A. R. Kemp and H. Peters[8] for polyhydrocarbons by the addition of iodine. Unsaturation of commercial butyral resin is of the order of 0.08 to 0.2 percent. Assuming average molecular weight of 24,000, approximately 2 to 10 double bonds occur in one molecule. The number of double bonds depends primarily on the catalyst used during manufacture. Sulfuric acid forms an addition product resulting, after neutralization, in the formation of unsaturation. Hydrochloric acid or organic acids, such as benzenesulfonic acid, form fewer double bonds. At these weak spots oxidation and chain splitting can easily occur during processing and aging. By adding small quantities of anti-oxidants to the resin, discoloration and decrease in molecular weight can be reduced.

A second type of degradation is the splitting off of aldehyde during processing and aging. The number of polyvinyl alcohol groups does not increase in the same ratio as the decrease in butyral groups, because some of the hydroxyl groups are changed into ether linkages. For instance, the increase of polyvinyl alcohol content is only ½% at a decrease of 3 to 5% in butyral content. The aldehyde freed can give rise to bubble formation in safety glass and is oxidized to the acid in air.

[7] L. S. Soloveichik, Zavodskaya Lab. *13*, 1051 (1947); *15*, 418 (1949).
[8] A. R. Kemp and H. Peters, Ind. Eng. Chem. Analytical Ed. *15*, 453 (1943).

Physical Properties

Softening point—In the series of aliphatic acetal resins softening point decreases with increasing chain length of the aldehyde as is shown in Fig. 4 for various acetal resins of an average acetal percentage of 65%. The softening point was determined by the Vicat method with a vertical steel needle 1 sq. mm. in cross section and a load of 5 kilograms. The temperature was raised at a constant rate of 50° C. per hour. The temperature at which the needle sank 1 mm. into the specimen is the softening point. With increasing degree of acetalization the softening point decreases in the series of the same acetal, as is shown for polyvinyl butyral in Fig. 5.

Transparency—For application as interlayer in safety glass very pure and transparent polyvinyl acetal resins are required, especially when using several interlayers. Bullet-resistant German panzer-glass generally consisted of six glass plates and five interlayers. In airplanes used as night-fighters only 2½% absorption of light was allowed for the glass, and 2½% for all five interlayers together.

Cold impact stress—The great advantage of polyvinyl acetal resins as interlayer in safety glass compared with cellulose acetate and acrylic resin is their excellent cold resistance which increases with the chain length of the aldehyde used. A 10 to 15% solution of the resin was prepared, mixed with 30 to 40 parts of of plasticizer, generally triethylene glycol dihexoate (3GH), dibutyl adipate, or dibutyl sebacate, per 100 parts of resin, and cast into sheets 0.02 in. thick. The dried film was pressed between two glass plates with rollers and heated for 30 min. at 266° F. in a hydraulic press. The 10- by 10-in. specimens were placed between two frames in a big Dewar flask filled with a cooling medium. A steel ball of 2-in. diameter was dropped from a height of 2 meters, and the temperature at which the ball penetrated through the interlayer was recorded.

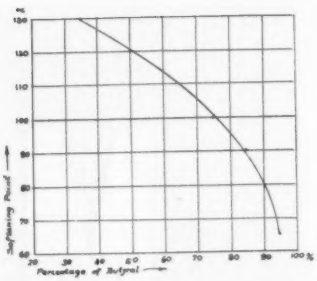


Fig. 5—Effect of butyral content on the softening point of acetal resins

The cold impact stress was improved by the following treatment[9]: the cast film was placed for 1 min. in a mixture consisting of 70 parts of benzyl alcohol, 30 of triacetin, and 2 of tetraethyl silicate. The wet film was put between the two glass plates. The surplus of solvent was squeezed out between rollers, preventing the sealing in of air bubbles. The small percentage of tetraethyl silicate resulted in an excellent adhesion to the glass and lowered the temperature required for penetration of the ball (Table I).

The mechanical properties of the unplasticized polyvinyl acetal resins are summarized in Table II.

[9] G. M. Kline, CIOS Report XXIX-62, p. 60.

Table II — Mechanical Properties of Polyvinyl Acetal Resins

Property	*Polyvinyl formal*	*Polyvinyl acetal*	*Polyvinyl butyral*
Tensile strength, p.s.i.	9000–12,000	7000–10,000	4000–8500
Elongation, %	7–11	10–30	15–60
Modulus of elasticity in tension, 10^5 p.s.i.	2.5	3.0	3.5–4.0
Impact strength (Izod), ft.-lb./sq. in. of notch	0.5–1.0	0.6–0.9	0.74–0.82



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General

POLYMERS AT THE CHEMICAL LABORATORY. Plastics (London) *16*, 44-5 (Feb. 1951). Projects at the Chemical Research Laboratory on polymers and plastics are described. Ion exchange resins, relation between chain length and properties, copolymers of styrene and acenaphthylene, copolymers of butadiene and acenaphthylene, copolymers of vinyl chloride with ammonia and amines, crosslinking of polystyrene, and adhesives for metals are being investigated.

UNDERWRITERS' LABORATORIES VIEWPOINT ON THE USE OF PLASTICS. K. S. Geiges. SPE J. *7*, 34-6 (Feb. 1951). The attitude of the engineers of the Underwriters' Laboratories toward plastics in electrical applications is discussed.

PLASTICS INDUSTRY IN GREAT BRITAIN. H. V. Potter, SPE J. *7*, 9-13 (Feb. 1951). The present status of the plastics industry in Great Britain and the activities of various associations are described.

CELLULOSE CHEMISTRY. W. O. Kenyon. Ind. Eng. Chem. *43*, 820-30 (Apr. 1951). A historical review of cellulose chemistry is presented.

RUBBER CHEMISTRY. R. P. Dinsmore. Ind. Eng. Chem. *43*, 795-803 (Apr. 1951.) A historical review of rubber chemistry is presented. 72 references.

Materials

BUTADIENE-STYRENE RESINOUS COPOLYMERS. J. D. D'Ianni, L. D. Hess, and W. C. Mast. Ind. Eng. Chem. *43*, 319-24 (Feb. 1951). The polymerization processes and properties of high-styrene butadiene-styrene copolymer resins were investigated. A series of butadiene-styrene copolymers with charging ratios of 50/50, 40/60, 30/70, 20/80 and 10/90 was prepared. Polystyrene, prepared under the same conditions, was included as a control. Properties of the latices and resins obtained, presented in a systematic manner, were found to be largely dependent on the monomer ratio employed in the polymerization. These materials are used as rubber reinforcing agents, impact-resistant plastics, and protective coatings.

MOLECULAR STRUCTURE OF STYRENE-BUTADIENE COPOLYMERS. L. E. Nielsen, R. Buchdahl, and G. C. Claver. Ind. Eng. Chem. *43*, 341-5 (Feb. 1951). The dynamic shear modulus, mechanical damping, swelling properties in benzene, and infra-red spectra were determined on a series of styrene-butadiene copolymers which were prepared under a variety of polymerization conditions. Evidence is presented that indicates it may be possible to prepare a polybutadiene rubber which retains its rubberlike properties down to -120° C. Materials of the same over-all composition were often found to differ greatly in structure as determined by these experimental methods. Many of these differences can be explained in terms of various types of heterogeneity found in the copolymers. The temperature of maximum mechanical damping is primarily determined by the composition of the copolymer whereas the width of the damping peak is related to the heterogeneity of the material.

POLYETHYLENE—PROPERTIES AND USES. G. Blum. SPE J. *7*, 7-11 (Jan. 1951). The properties and uses of polyethylene are reviewed. 27 references are included.

POLYAMIDE RESIN SUSPENSOIDS. H. Wittcoff. Modern Packaging *24*, 111-15 (Mar. 1951). A group of polyamide resins of particular value as adhesives and coatings is described. Data on water-vapor permeability, greaseproofness, blocking, solvent resistance, compatibility with various plasticizers, film properties, and compounding are presented.

TANNIN-FORMALDEHYDE RESINS AS ADHESIVES FOR WOOD. L. K. Dalton. Australian J. Applied Sci. *1*, 53-70 (Mar. 1950). The tannin extracts fall into two groups: *reduncа* and *consideniana* tannins are too unreactive to produce satisfactory adhesives; *mimosa*, *calcarata*, *glauca*, and *crebra* tannins react with formaldehyde to give adhesives setting at moderate temperatures. At room temperature, however, the joint strengths are not as high as those from a resorcinol-formaldehyde adhesive. The adhesives may be prepared simply, and only a small proportion of formaldehyde is required. Tannins, suitable for the preparation of adhesives, may be extracted from barks which are waste products in the timber industry. Such barks are being surveyed to determine their suitability as tanning agents.

Molding and Fabricating

AFTER-TREATMENT OF MOLDED POLYSTYRENE. C. T. Snyder. SPE J. *7*, 17-19 (Feb. 1951). The degree of strain in polystyrene moldings is revealed by immersing the part in various hydrocarbon solvents and observing the crazing. The effects of molding cycles and annealing on this tendency to develop crazing are shown.

CONDITIONING PHENOLIC MATERIALS FOR STABILITY IN MOLDING. J. L. Formo. SPE J. *7*, 13-15, 38 (Feb. 1951). The relations between moisture content and preheat technique of phenolic molding compounds and the dimensional stability, physical properties, and electrical properties of the molded parts are described.

BLANKING OF LAMINATES. E. Mills. Brit. Plastics *23*, 196-7 (Dec. 1950). The cutting of parts from sheet laminates with dies and machinery is described in detail.

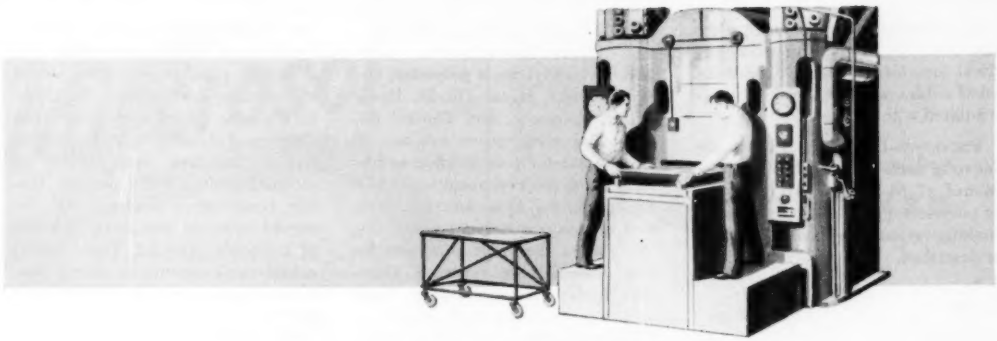
Applications

TRANSPARENT CAN. Modern Packaging *24*, 83 (Dec. 1950). Seafoods are packed in a can in which the body is manufactured of cellulose acetate plastic.

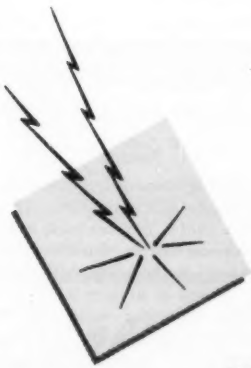
PLASTICS IN PARLIAMENT. Brit. Plastics *23*, 174-5 (Dec. 1950). Polyvinyl butyral and sheet acrylic plastic are used in the lighting fixtures of the new House of Commons.

FLAME-RETARDANT PROPERTIES OF INSULATED ELECTRIC CABLE. Plastics (LONDON) *16*, 16-17 (Jan. 1951). Electrical cables with rubber, polyethylene, and polyvinyl chloride in-

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sulation were tested to determine the rate of burning and the effect of electrical overloads. The plastic-insulated cables were superior to those insulated with rubber.

POLYESTER-GLASS LAMINATES FOR MOTOR PARTS. R. B. White. Electrical Manuf. *47*, 84-7 (Jan. 1951). The use of polyester-glass fiber laminates for making various electrical motor parts is described.

PLASTICS IN MODERN SCHOOL CONSTRUCTION. J. B. Singer. Plastics (London) *16*, 31-3 (Feb. 1951). Building construction in which plastic panels made with separating ribs, honeycomb cores, glass wool, and expanded plastics are used is described. Corrugated acrylic plastic sheets and decorative wall panels are other construction materials used.

POLYESTER RESINS IN THE ELECTRICAL INDUSTRY. B. Parkyn. Brit. Plastics *24*, 47-9 (Feb. 1951). The synthesis, chemistry, properties and applications of polyester resins, particularly in electrical uses, are reviewed.

LAMINATES IMPROVE BOW PERFORMANCE. Brit. Plastics *23*, 194 (Dec. 1950). Archery bows are made of a plastic laminate.

Properties

INSULATION RESISTANCE OF THERMOSETTING LAMINATES. N. A. Skow. Elec. Manuf. *47*, 100-3, 244, 246, 248 (Mar. 1951). The insulation resistance of a laminate exposed to humid conditions depends on, and can be predicted from, its water absorption characteristics. Under relatively dry atmospheric conditions, the following conclusions apply: most of the standard high-pressure laminates have good insulation resistance; if high impact strength is needed, a fabric-base material will be required; and if heat-resistance is a requisite, asbestos or glass-base materials should be specified. Under humid conditions, if impact strength is not vital, Grade XXXP will perform satisfactorily; where high impact strength must be present, Grade N1 will be required.

COMPRESSIBILITY OF NATURAL AND SYNTHETIC HIGH POLYMERS AT HIGH PRESSURES. C. E. Weir. J. Research Nat. Bureau Standards *46*, 207-12 (Mar. 1951). Compression data are reported between 1000 and 10,000 atm. for the following materials: dry cellulose, saran, polyethylene, polymonochlorotrifluoroethylene, polytetrafluoroethylene, a polyester, and raw rubbers, Hycar OR-25, Hycar OR-15, neoprene, and Thiokol ST. All compression curves are smooth except that for polytetrafluoroethylene, which shows a transition at 5500 atm., resulting in a change in volume of approximately 2 percent. Coefficients of the cubic equations for each material are reported. Compressibilities calculated from these equations show fictitious minima at about 10,000 atm., although the equations represent the data satisfactorily to 10,000 atm. The data given compare favorably with those obtained on similar materials by previous workers.

EFFECT OF COLLOIDAL NONCARBON PIGMENTS ON ELASTOMER PROPERTIES. E. Schmidt. Ind. Eng. Chem. *43*, 679-83 (Mar. 1951). Noncarbon pigment materials were obtained in a state of subdivision approaching or surpassing that of reinforcing carbon blacks by incorporating these materials in the form of colloidal solutions in elastomer latex. Using this technique, marked tensile and modulus reinforcement of GR-S type rubber is obtained with solid substances of widely differing chemical nature, such as stannic oxide, silica, Prussian blue, polystyrene, and casein. The most pronounced effects were obtained with the pigments of smallest particle size. Colloidal stannic oxide produces tensile and modulus reinforcement that exceeds that obtained with EPC black. The results indicate that small particle size of the pigment is of prime importance in elastomer reinforcement, whereas the chemical nature of the pigment appears to be of secondary importance.

EFFECT OF STRAIN RATE ON THE TENSILE AND COMPRESSIVE STRESS-STRAIN PROPERTIES OF POLYSTYRENE. C. C. Hsiao and J. A. Sauer. ASTM Bull. No. 172, 29-35 (Feb. 1951). The effect of rate of straining on both the tensile and compressive stress-strain properties of polystyrene was studied. A simple, inexpensive apparatus was devised for maintaining a constant rate of strain throughout the duration of the test and for permitting various constant rates of strain to be applied. The apparatus was used to make tests at rates of strain ranging from 5×10^{-6} per sec. to approximately 700×10^{-6} per second. Under tensile loading, polystyrene at room temperature behaves in a brittle manner over the entire strain range investigated. The fracture strain varied very little with changes of strain rate, and all of the tensile fractures occurred at an elongation of 1.4 to 1.5 percent. Under compressive loading, the observed behavior was more like that of a ductile material. There was a considerable amount of plastic flow at all rates of straining, and fracture did not occur even though the tests were continued until a 16% strain change had occurred. Modulus of elasticity and maximum stress increase with increase of testing speed in both tensile and compressive loading. For a four-fold strain rate increase, the increase in modulus is approximately 4.5 to 5% for tensile loading and approximately 2% for compressive loading. The maximum compressive stress and the maximum tensile stress are found to vary linearly with the log of the strain rate.

Testing

FILM THICKNESS MEASUREMENTS. E. J. Dunn, Jr. ASTM Bull. No. 172, 35-9 (Feb. 1951). Two methods for the measurement of the thickness of dry films are described. One method is for films 0.5 mil or greater in thickness and the other for those less than 0.5 mil in thickness. The first is also described in A.S.T.M. Tentative Method D 1005-49T. The results of round robin tests with these two methods are reported. Various makes of gages were used.

SPECTROPHOTOMETRIC DETERMINATION OF TOTAL PHTHALIC ANHYDRIDE. O. D. Shreve and M. R. Heether. Anal. Chem. *23*, 441-5 (Mar. 1951). The standard Kappelmeier procedure for the determination of total phthalic anhydride in alkyd resins and other phthalate esters cannot be applied in the presence of esters of other polycarboxylic acids, many unsaponifiable resins, and other materials used in the formulation of modern surface coatings. A new method based on ultra-violet absorption spectrophotometry and possessing a much wider range of application than the Kappelmeier method was developed. Accurate results are rapidly obtained from a single absorption measurement at 276 mμ on an acidified aqueous solution of the usual Kappelmeier precipitate. The method

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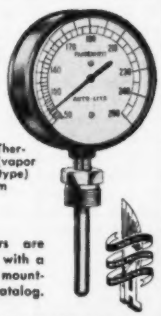
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A Test Method for Determining Fogging Properties of Organic Materials. V. J. Marchese and S. J. Klima. ASTM Bull. No. 172, 40-3 (Feb. 1951). Organic materials such as lubricating oils, greases, wire insulation, rubber, and plastics, which are used in equipment operated at high ambient temperatures, form vapors which may condense to produce fogging problems. A test method was developed for evaluating and recording the fogging properties of organic materials on a comparative basis to determine whether they will be suitable for use at ambient temperatures of approximately 82° C. It is possible by means of this test procedure to select materials having low fogging characteristics for use in equipment where fogging is a problem.

Classification of Thermoplastic Resins by Their Plasticities. W. H. Willert. SPE J. 7, 7-10 (Mar. 1951). A simple rapid test is described for determining the flow characteristics and plasticity of thermoplastics in such a manner that the data are useful in selecting molding machine cycles and conditions.

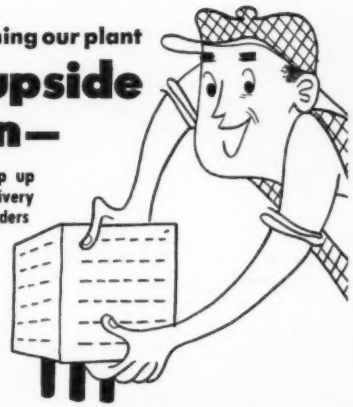
Coatings

Spray Gun for Polymeric Emulsions and Solutions. C. A. Nielson and F. Leonard. Ind. Eng. Chem. 43, 765-6 (Mar. 1951). A gun for spraying high-solids (55 to 65%) latices of natural rubber, synthetic copolymer latices of ethyl acrylate and acrylonitrile, and GR-S types without specifically compounding for spraying applications is described. Films 0.030 in. thick by 9 in. long by 7 in. wide were sprayed on a glass plate using ethyl acrylate-acrylonitrile copolymer latices. The gun eliminates, in the samples tested, the necessity for diluting the latices, addition of stabilizers, and other procedures for preparing the samples for spraying. The major difficulties of spray gun clogging and cobwebbing were eliminated.

Masking Problems in Spray Painting. H. E. MacArthur. SPE J. 7, 19-21 (Feb. 1951). Masks for spray painting of plastic parts consist of electroformed metal shields. Production problems concerned with this technique are discussed.

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CELLULOSE ESTERS. C. J. Malm and C. L. Crane (to Eastman). U. S. 2,539,451, Jan. 30. Method of preparing cellulose sulfate.

COPOLYMERS. J. C. Reid, Jr. (to Atlantic Refining). U. S. 2,539,523, Jan. 30. Polymerization of olefin mixtures with aluminum chloride.

COPOLYMERS. L. Schmerling (to Universal Oil Products). U. S. 2,539,675, Jan. 30. Reducing color and unsaturation of copolymers of polyolefinic cyclic hydrocarbons.

SHEET. H. F. Boorn (to U. S. Rubber). U. S. 2,539,690, Jan. 30. Plastic sheets with inlaid stripes.

POLYMERS. D. L. Schoene and V. S. Chambers (to U. S. Rubber). U. S. 2,539,704, Jan. 30. Subjecting a polysaccharide to reaction of a monovinyl sulfone.

COPOLYMER. R. H. Snyder (to U. S. Rubber). U. S. 2,539,706, Jan. 30. Copolymer of dimethallyl ether and an alkyl acrylate.

CUTTER. S. G. Ludington and K. E. Stober (to Dow). U. S. 2,539,916, Jan. 30. Reciprocating cutter for plastic materials.

POLYMERS. P. W. Morgan (to Du Pont). U. S. 2,539,920, Jan. 30. Cross-linking polymers having certain side groups by reacting with a polythiourea.

COPOLYMERS. J. T. Hays (to Hercules). U. S. 2,540,072, Jan. 30. Preparation of copolymers of chloromaleic anhydride and butadiene.

POLYSTYRENE. K. E. Stober (to Dow). U. S. 2,540,146, Feb. 6. Controlled blending of polystyrene with modifiers.

COPOLYMERS. R. S. Wilder and D. F. Herman (to Publicker). U. S. 2,540,153, Feb. 6. Preparation of polymers of vinyl *tert*-hydroxy ketones.

PHENOLIC RESIN. R. G. Newberg and D. W. Young (to Standard Oil Development). U. S. 2,540,592, Feb. 6. Phenol-aldehyde resin plasticized with copolymer of a conjugated diolefin and acrylonitrile.

RESINS. H. L. Allen and E. G. Kerr (to Allied Chemical). U. S. 2,540,641, Feb. 6. Indene-modified phenol-aldehyde resins.

NYLON TREATMENT. B. Graham and O. E. Schupp, Jr. (to Du Pont). U. S. 2,540,726, Feb. 6. Treating a heat-set, oriented nylon fabric with formaldehyde.

RESIN. W. F. Busse (to General Aniline). U. S. 2,540,748, Feb. 6. Heat softenable polyvinyl carbazole dielectric.

RESINS. L. E. Caldwell (to American Cyanamid). U. S. 2,540,776, Feb. 6. Reacting a rosin-butenedioic acid adduct with an alkylol primary amine.

COPOLYMERS. F. P. Otto and R. W. Barrett (to Socony-Vacuum). U. S. 2,540,794, Feb. 6. Copolymers of maleic anhydride and thiophene.

POLYAMIDES. C. W. Tullock (to Du Pont). U. S. 2,540,855, Feb. 6. Formic acid solutions of synthetic linear polyamides from α-amino acids.

RESINS. D. A. Hurst and W. J. Miller, Jr. (to Allied Chemical). U. S. 2,540,885-6. Feb. 6. Process for producing cyclohexanone-formaldehyde resins.

POLYMERIZATION. J. P. Jones (to Phillips Petroleum). U. S. 2,540,949-50, Feb. 6. Polymerization of vinylcyclopropane and its homologs.

FILM. H. F. Puppolo (to Sprague Electric). U. S. 2,540,962, Feb. 6. Process for producing polytetrahaloethylene films.

NON-ELECTROSTATIC PLASTIC. J. B. Eisen (to Monsanto). U. S. 2,540,981, Feb. 6. Moldable resin and a cycloaliphatic monoamine salt of an alcohol sulfate.

COPOLYMERS. E. F. Jackson (to Monsanto). U. S. 2,540,984-5, Feb. 6. Copolymers of vinyl pyridine and polyvinyl aromatic compounds.

PRESHRINKING. W. A. Klein, R. R. Trull, and E. V. Dettmer (to Dow). U. S. 2,540,986, Feb. 6. Apparatus for preshrinking crystalline vinylidene chloride copolymer film.

COATING. L. L. Ryden (to Dow). U. S. 2,540,996, Feb. 6. Wax-latex coating for protecting plastic surfaces.

PLASTICIZERS. H. E. Dutot and M. H. Bradley (to American Cyanamid). U. S. 2,541,004, Feb. 6. Ethers of isopropylidene di(*p*-phenol) as plasticizers for thermoplastic resins.

RESINS. W. N. Oldham and J. R. Dudley (to American Cyanamid). U. S. 2,541,005, Feb. 6. Synthetic resins made of aldehyde condensates.

INTERPOLYMERS. J. R. Caldwell (to Eastman Kodak). U.S. 2,541,011, Feb. 13. Interpolymers of acrylonitrile, fumaric acid, a vinyl monomer.

RESIN. T. F. Bradley (to Shell Development). U.S. 2,541,027, Feb. 13. Heat-curable resins of epoxy ethers and orthophosphoric acid.

TUBING. C. R. Irons (to Dow). U.S. 2,541,064, Feb. 13. Method of controlling diameter and wall thickness of vinylidene chloride polymer tubing.

ELASTOMERS. E. L. Warrick (to Dow Corning). U.S. 2,541,137, Feb. 13. Preparing a diorganosiloxane elastomer.

RESIN. H. J. West (to American Cyanamid). U.S. 2,541,139. Feb. 13. Blending an alkyd resin and ether of dimethylol urea.

POLYMERS. T. L. Cairns (to Du Pont). U.S. 2,541,152, Feb. 13. Polymers of N-vinyl alkylene ureas.

POLYMERIZATION. H. Dannenberg and D. E. Adelson (to Shell Development). U.S. 2,541,155, Feb. 13. Production of an oxy polymer of methallyl alcohol.

INTERPOLYMERS. G. Pitzl (to Du Pont). U.S. 2,541,167, Feb. 13. Vinylidene chloride interpolymer as a coating for regenerated cellulose film.

FLUORESCENT RESINS. R. C. Ackerman (to Sun Chemical). U.S. 2,541,184, Feb. 13. Reacting a resin of an aldehyde and a ketone with a dicyandiamide.

EXTRUSION. H. Buecken and E. E.

(*Continued on p. 159*)

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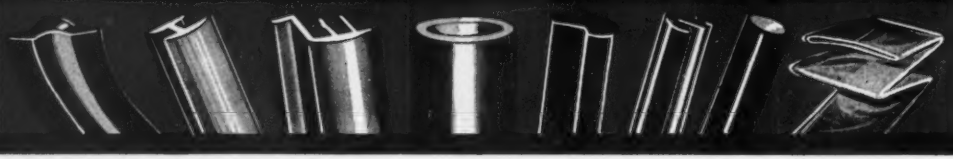
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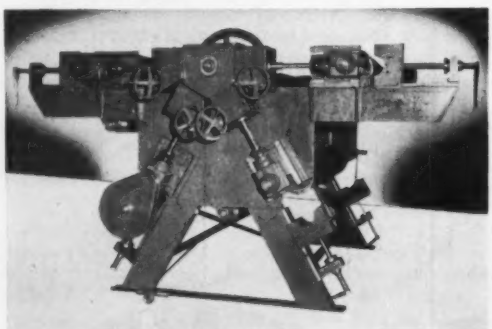
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Heston (to National Rubber Machinery). U.S. 2,541,201, Feb. 13. Screw-feed extrusion device.

SHEETS. R. W. Canfield (to Plax). U. S. 2,541,203, Feb. 13. Apparatus for forming oriented sheet of thermoplastic polymer.

MOLD. J. R. Hobson (to Plax). U.S. 2,541,249, Feb. 13. Multiple cavity mold for extruding hollow plastic articles.

CELLULOSE ETHERS. W. B. Horback (to Celanese). U.S. 2,541,252, Feb. 13. Composition of ethyl cellulose, mineral oil, and polystyrene.

DISH-SHAPED ARTICLES. F. W. Sampson and P. A. Norris (to General Motors). U.S. 2,541,297, Feb. 13. Method of forming thermoset resin dish-shaped articles.

POLYMERS. J. B. Dickey (to Eastman Kodak). U.S. 2,541,465-6, Feb. 13. Polymers of α-fluoromethacrylamides and α-fluoromethyl acrylonitriles.

LAMINATING. G. F. Nadeau and C. B. Starck (to Eastman Kodak). U.S. 2,541,478-9, Feb. 13. Bonding together two modified polyvinyl alcohol sheets with a hardening agent such as zirconium nitrate.

CHLORINATED POLYETHYLENE. A. W. Anderson and S. C. Overbaugh (to Du Pont). U.S. 2,541,492, Feb. 12. Chlorinated polyethylene stabilized with glycidyl esters of fatty acids and methyl glucamine.

MOLD. H. E. Lietaert to (Monroe Auto Equipment). U.S. 2,541,592, Feb. 13. Injection mold and pressure control for filling.

ABRASIVE. J. S. Masin and T. C. Allen (to Monsanto). U.S. 2,541,658, Feb. 13. Abrasive grain coated with a "plastic phosphate."

RESIN. W. R. Richard (to Monsanto). U.S. 2,541,667, Feb. 13. Plasticized polyvinyl formal resin.

THERMOPLASTICS. L. E. Daly (to U. S. Rubber). U.S. 2,541,748, Feb. 13. Tough, boardy thermoplastic mixture of a rubber, a vulcanizing agent, and a butadiene-styrene elastomer.

SILOXANE. J. G. E. Wright (to G. E.). U.S. 2,541,851, Feb. 13. Puttylike elastic siloxane composition containing zinc hydroxide.

MOLDING COMPOSITIONS. N. Vasileff and A. C. Alesi (to Research Corp.). U.S. 2,541,896, Feb. 13. Laminate of glass cloth bonded with phenol-, urea-, or aniline-aldehyde resin and a tertiary butoxysilanol.

RESINS. R. B. Bailey and C. C. Watkins (to Zehrung Chemical). U.S. 2,541,909, Feb. 13. Cation-exchange phenolic resins.

MOLDING COMPOSITIONS. E. L. Kropa and J. P. Dunne (to American Cyanamid). U.S. 2,541,927, Feb. 13. Composition of melamine aldehyde condensate and acrylonitrile polymer.

POLYMER. R. D. Cramer (to Du Pont). U. S. 2,541,987, Feb. 20. Chlorine-containing polymer plasticized with a greaselike olefin-carbon monoxide polymer.

RESINS. F. J. Nagel (to Westinghouse). U.S. 2,542,048, Feb. 20. Composition of a thermoplastic polymer and a polyhydroxy benzene-aldehyde composition.

POLYMERS. G. W. Young (to G. E.). U.S. 2,542,069–70–71–72, Feb. 20. Suspensions and solutions of polymeric chlorotrifluoroethylene.

RESINS. H. S. Bloch (to Universal Oil Products). U.S. 2,542,111, Feb. 20. Reacting an alkyl benzene, a phenol, and a dihaloalkane in the presence of a Friedel-Crafts catalyst.

VINYL RESIN. G. R. Buchanan, Jr. (to Monsanto). U.S. 2,542,179, Feb. 20. Heat stabilized polyvinyl chloride compositions.

MOLDING. A. W. Schultz (to Clearance Machine). U.S. 2,542,263, Feb. 20. Process for molding high temperature thermoplastic material.

CONDENSATES. J. F. Hyde (to Corning). U.S. 2,542,334, Feb. 20. Siloxane condensates.

LENSES. J. O. Beattie. U.S. 2,542,-386, Feb. 20. Manufacture of plastic lenses from polymeric materials.

COPOLYMERS. J. H. Bannon (to Standard Oil Development). U.S. 2,542,459, Feb. 20. Copolymerization of an isoolefin and a multi-olefin.

MOLDING POWDERS. L. M. Debing and R. M. Huck (to Monsanto). U.S. 2,542,484, Feb. 20. Alkali-resistant phenolic molding powders and laminates.

POROUS MATERIAL. E. M. Honey and C. R. Hardy (to Electric Storage Battery). U.S. 2,542,527, Feb. 20. Production of microporous polyvinyl chloride.

LAMINATES. H. F. Sullivan (to Formica). U.S. 2,542,593, Feb. 20. Method of making circular bodies of fabric impregnated with a phenolic condensate.

FILAMENTS. H. T. Tornberg (to Modern Plastic Machinery). U.S. 2,542,595, Feb. 20. Orientation machine for plastic filaments.

RESINS. C. D. Doyle (to G. E.). U.S. 2,542,641, Feb. 20. Preparation of polysiloxane resins.

CONDENSATES. S. O. Greenlee (to Devoe & Raynolds). U.S. 2,542,664, Feb. 20. Compositions of phenol-oil condensates and polyepoxides.

POLYMERS. W. E. Hanford and J. R. Roland (to Du Pont). U.S. 2,542,-771, Feb. 20. Reacting polymeric materials with ethylene.

RESINS. R. S. Schreiber (to Du Pont). U.S. 2,542,782, Feb. 20. Allylated polymeric ketones.

EMULSIONS. L. Seed (to I. C. I.). U.S. 2,542,783, Feb. 20. Emulsions of ethylene polymers and interpolymers.

RESISTOR. S. Gilman and J. E. Hill (to Westinghouse). U.S. 2,542,808, Feb. 20. Resistor formed of a thermoset resin prepared by reacting a vinyl monomer with an ester of castor oil and an unsaturated carboxylic acid.

COPOLYMERS. H. F. Minter (to Westinghouse). U.S. 2,542,827, Feb. 20. Insulation comprising mica flakes bonded with copolymers of vinyl aryl compounds, acrylonitrile, diallyl esters, and unsaturated dicarboxylic acids.

CRINKLED FIBERS. N. W. Abernathy (to Dow). U.S. 2,542,973, Feb. 27. Method for extruding crinkled saran fibers.

POLYMERIZATION. A. V. Grosse (to Houdry Process). U.S. 2,543,016, Feb. 27. Catalytic polymerization of olefins.

CRINKLED FIBERS. L. V. Jones (to Dow). U.S. 2,543,027, Feb. 27. Method for making crinkled saran fibers.

POLYMERIZATION. C. A. Brighton and J. J. P. Staudinger (to Distillers). U.S. 2,543,094, Feb. 27. Polymerizing aqueous dispersions of vinylidene chloride with urea-alde-

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MOLDING. J. N. Kuzmich (to Conmar Products). U.S. 2,543,111, Feb. 27. Apparatus for molding plastic slide fasteners.

POLYETHYLENE. A. F. Chapman (to Du Pont). U.S. 2,543,229, Feb. 27. Polyethylene bonded with an ethylene-vinyl acetate interpolymer adhesive.

RESINS. E. M. Evans and H. T. Hookway (to British Resin Products). U.S. 2,543,237, Feb. 27. Production of resinous compositions from sulfones and formaldehyde.

POLYMERIZATION. H. P. Staudinger (to Distillers). U.S. 2,543,306, Feb. 27. Polymerization of styrenes in the presence of alcohol diluents and unsaturated peroxides.

MILLING. H. A. Swallow and H. H. Anderson (to Carbide and Carbon). U.S. 2,543,307, Feb. 27. Plastic milling apparatus.

RESINS. J. W. Copenhauer (to General Aniline). U.S. 2,543,312, Feb. 27. Resinous acetals and process for hydrolyzing to produce unsaturated aldehydes.

POLYETHYLENE. C. S. Myers (to Carbide and Carbon). U.S. 2,543,329, Feb. 27. Polyethylene stabilized with diphenylamine.

POLYMERIZATION. B. Phillips, Jr., and W. M. Quattlebaum, Jr. (to Carbide and Carbon). U.S. 2,543,335, Feb. 27. Process for polymerizing divinylbenzene and polyolefinic esters.

CHLOROTRIFLUOROETHYLENE. E. L. Kropa and J. J. Padbury (to American Cyanamid). U.S. 2,543,530, Feb. 27. Method of treating scrap chlorotrifluoroethylene so that it becomes suitable for reuse.

ANTISTATIC TREATMENT. I. Wizon (to American Cyanamid). U.S. 2,543,539, Feb. 27. Copolymerizing vinyl resin with acrylonitrile to reduce tendency to accumulate static charge.

PEELABLE COATING. H. E. Smith (to Insl-X). U.S. 2,543,557, Feb. 27. Coating comprising lanolin and a methyl methacrylate resin.

RESINS. S. P. Rowland (to Rohm and Haas). U.S. 2,543,601-2, Feb. 27.

(*Continued on p. 163*)

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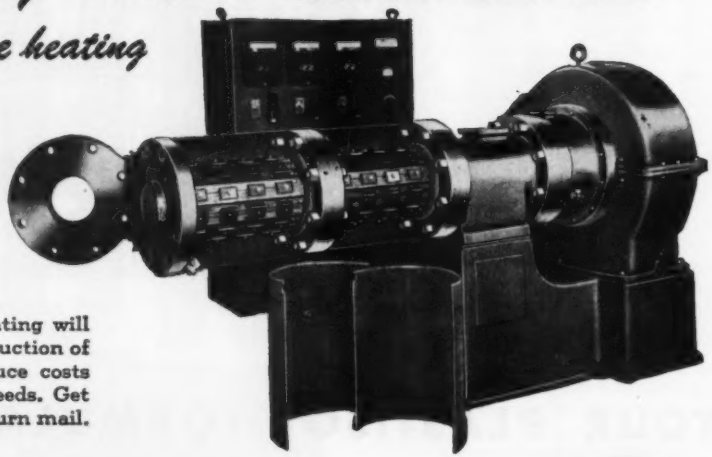
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POLYMERIZATION. J. A. Loritsch (to G. E.). U.S. 2,543,635-6, Feb. 27. Polymerizing alkyd resins in the presence of an organo-phosphorus compound or dibutyl sulfite.

EXTRUSION. J. W. Van Riper. U.S. 2,543,679, Feb. 27. Extrusion apparatus.

POLYMERS. J. G. M. Bremner (to I. C. I.). U.S. 2,543,685, Feb. 27. Production of liquid polymers from dihydropyran.

POLYMERIZATION. R. C. Reinhardt (to Dow). U.S. 2,543,805, Mar. 6. Suspension polymerization of vinylidene chloride polymers and copolymers.

RESIN. F. E. Frey (to Phillips Petroleum). U.S. 2,543,842, Mar. 6. Monoolefin-sulfur dioxide resin plasticized with a sulfone.

EXTRUDING. R. Colombo. U.S. 2,543,894, Mar. 6. Screw press for mixing and extruding plastic materials.

PLASTIC MASS. C. C. Heritage (to Wood Conversion). U.S. 2,544,019, Mar. 6. Moldable preform material consisting of a heat-moldable binder and vegetable fibrous material.

TUBING. C. G. Reber and S. Dalzell III (to Plax). U.S. 2,544,044, Mar. 6. Apparatus for forming gusseted thermoplastic tubing.

ARTICLE FORMING. F. J. Dofsen and E. L. Danielson. U.S. 2,544,140, Mar. 6. Forming an article from two different plastics by injecting one to combine with a preform of the other.

CONDENSATES. E. S. Blake (to Monsanto). U.S. 2,544,292, Mar. 6. Condensates of polyhydric phenols and polyhydric alcohols.

UREA RESINS. C. H. Parker, Jr. (to American Cyanamid). U.S. 2,544,351, Mar. 6. Process for preparing butylated urea-formaldehyde resins.

RESINS. B. E. Sorenson (to Du Pont). U.S. 2,544,365, Mar. 6. Acylated phenol-formaldehyde resins containing ketene polymers of higher fatty acids.

FIBER. C. A. Hochwalt (to Monsanto). U.S. 2,544,385, Mar. 6. Fibers comprising copolymers of acrylonitrile, methacrylonitrile, and vinyl acetate.

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BOOKS AND BOOKLETS

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"Natural and Synthetic High Polymers" by K. H. Meyer.

Published by Interscience Publishers, Inc., 250 Fifth Ave., New York 1, N. Y. 912 pages. Price, $15.00

Covering the whole field of polymers, this second edition of a specialized text has been completely revised and augmented by over 200 pages. The result is an up-to-date, unified account of the physical, chemical, and biological properties of natural and synthetic, inorganic and organic high polymers. Developments in the field as to theoretical concepts, new groups of polymer substances, and new applications here and abroad which have occurred since the appearance of the first edition in 1942 have been taken fully into account.

"Industrial Research Laboratories of the United States"

Published by National Research Council, 2101 Constitution Ave., Washington 25, D. C. 445 pages. Price, $5

In its ninth edition, this directory contains information on the research laboratories of almost 3000 industrial and commercial organizations, including the names of the president and research executives; the location of the laboratories; the numbers and kinds of research scientists and other personnel; the fields of research activity; and the size of the laboratory library. Two appendices are included, one providing the same information as above for government laboratories which cooperate with industry, the other listing universities and colleges which offer research services to industry. A geographical index and a complete subject index of research activities are provided.

"Monomers, Section II" edited by E. R. Blout and H. Mark.

Published by Interscience Publishers, Inc., 250 Fifth Ave., New York 1, N.Y. 264 pages. Price $5.00

Although the physical and chemical characteristics of monomers—simple organic substances capable of forming polymeric molecules—can be found in many texts, it has proved laborious and time-consuming to accumulate numerical data and exact procedure for dealing with these compounds. Thus, as a service to those interested in preparing and collecting polymers, the authors have assembled a series of comprehensive articles by authorities in the field who provide the following information on individual monomers: best method for preparing small quantities; methods for large-scale production; physical data; the most frequent impurities of the monomer and how they can be handled; details of handling and storage; conventional methods of polymerizing; a list of monomers with which a particular monomer copolymerizes easily; and chemical properties. In this, the second of a series, (and additions to which are in preparation), the monomers considered are: acrylic acid; esters of acrylic acid; acrylonitrile; butadiene; isobutylene; isoprene; methyl methacrylate; ester of methacrylic acid; styrene; vinyl acetate; N-vinylcarbazole; vinyl chloride; vinyl ethers; and vinylpyridine.

"The National Paint Dictionary" by Jeffrey R. Stewart.

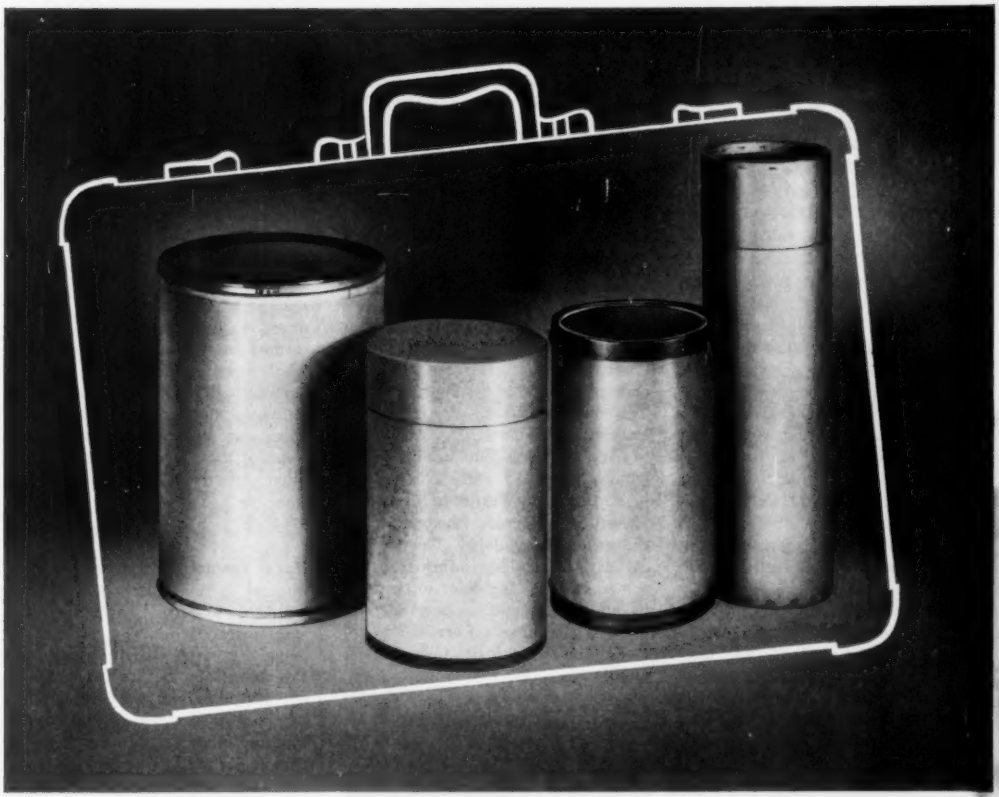
Published by Stewart Research Laboratory, P.O. Box 173, Benjamin Franklin Station, Washington, D.C. 704 pages. Price $7.50

Dissemination of authentic, concise, and practical information to manufacturers, distributors, and industrial users of protective and decorative coatings is the purpose of the third edition of this dictionary. Distinguishing it from the two previous editions is the inclusion of many new terms developed during World War II. In addition, the author has departed from the policy of securing information from handbooks, reference works, and similar publications, and has compiled his data from a cross-section of the opinion of leading scientific and technical men in the field. Contents of the volume are divided into these groups: industrial raw materials used in the production of paints and allied products; trade names of raw materials and certain finished products; terms describing processes, methods, systems, etc.; terms denoting scientific instruments used primarily for evaluation purposes; terms denoting colors, optical effects, textures, etc.; and miscellaneous terms which give general information, including jargon expressions peculiar to the industry.

Hydrolubes—Full data on the physical properties, advantages, and methods of using these fire-resistant hydraulic fluids are presented in this 12-page booklet. Their high viscosity index, low leakage loss, low freezing points, and safety features for workmen are described. The fluids are reported to have no effect on packings or seals when used in die-casting machines, mechanical manipulators, scrap balers, electric welders, and other equipment. *Carbide & Carbon Chemicals Div., Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.*

Traffic classification guide for plastics—Intended to serve as a guide for the proper description of products destined for transportation by rail and motor truck, this 22-page booklet stresses the need for applying proper classifications to all articles shipped. It contains descriptions of various plastic items, class ratings by the four major classifications covering movements between all points in the United States, a territorial description of all classification areas, and a map of the territories covered by the two New England Motor Freight Publishing Bureaus where classification of items is different from elsewhere in the country. *The Society of The Plastics Industry, Inc., 67 W. 44th St., New York 18, N. Y.*

Removing silica by deionization—This two-color, four-page folder, titled "Zero Hardness by Amberlite Deionization," is designed to help both power plant and chemical engineers evaluate the usefulness, applications, and recommended layout of ion exchange systems to provide water almost totally free from hardness, carbon dioxide, and silica. Case histories are presented, with results



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attained in deionization by typical Amberlite Monobed, two-, three-, and four-bed systems. The folder also describes how deionization works and suggests uses in the process and power industries. *Resinous Products Div., Rohm & Haas Co., Washington Sq., Philadelphia 5, Pa.*

Manual valves (Cat. 1B-1)—The entire range of shut-off, selector, and manipulator valves that the company manufactures for pressures of from 0 to 6000 p.s.i. are described in this 24-page booklet. It contains explanatory copy and illustrations of the patented Shear-Seal principle. Included in the catalog is a simple outline for determining proper valve size, with tables giving steel pipe data and capacities of hydraulic rams. *Barksdale Valves, 1566 E. Slauson, Los Angeles 11, Calif.*

Epon surface coating resins—Epon resins, representing an entirely new class of condensation polymer, are completely described in this 20-page booklet. Properties of resin surface coatings, the types of resins, and physical and chemical characteristics are discussed fully, and four of the Epon series are specifically detailed. *Shell Chemical Corp., 50 W. 50th St., New York 20, N. Y.*

Waxes—This collection of technical data sheets gives information on various waxes, many of which are replacements for carnauba and Japan waxes. Complete specifications, uses, and method of packaging are presented. Included are data sheets on cresylic acid. *Concord Chemical Co., Moorestown, N. J.*

Laminated plastics—This 62-page catalog covers basic engineering data on the company's products and is intended to help the design engineer, production engineer, or buyer find a material suitable for his specific requirements. Divided into four main sections, it includes vulcanized fiber, phenol fiber and special laminates, design and machining hints, and engineering and research facilities. Charts and tables present engineering data. *Taylor Fibre Co., Norristown, Pa.*

Inventory control and priorities—In question and answer form, this 13-page pamphlet is designed to give the information most frequently sought from the National Production Authority about the application of NPA Regulations 1 and 2. The former limits the quantities of scarce materials that can be ordered, received, or delivered; the latter establishes a system of priorities assuring the right of way for production of materials and goods for national defense. Copies may be obtained from any local field office of *National Production Authority.*

Coloring—A series of booklets on various aspects of coloring has been issued, accompanied by a technical chart describing uses of the company's products. The folders deal with "The Technique of Dry Coloring Polyester Resins," "The Technique of Dry Coloring Plastisol and Organosol Resins," and "New Inorganic Colors by Ferro" in which are presented full color illustrations of the material available. The technical data sheet lists information on the amount of each color to be used, its effect on certain operations, and its dispersibility. *Ferro Enamel Corp. 4150 E. 56th St., Cleveland 5, Ohio.*

Boosters and their practical application—Advantages and uses of dual pressure boosters manufactured on a low cost production line basis from standard air and hydraulic cylinder components are highlighted in a four-page editorial reprint. Merits of the equipment emphasized in the folder are savings in air consumed and on circuit valves; holding of pressures (up to 10,000 p.s.i.) indefinitely; and convenient adaptability to circuits of small to medium volume. Circuit drawings, illustrations, and a detailed description of typical practical applications are presented. Also discussed are single-pressure boosters and methods of returning booster-driven hydraulic cylinders. *Miller Motor Co., 4027 N. Kedzie Ave., Chicago 18, Ill.*

Protecting company security—Measures to combat sabotage and fifth-column activity in plants are outlined in a 13-page "blueprint." Topics considered cover methods of determining whether or to what degree a firm is vulnerable; policy adjustments; setting up a security program; tracking down potential threats to security; working with unions; getting help from government agencies; and the role of supervisors and foremen. Throughout the report, the need for approaching the problem "slowly, soberly, and quietly," is emphasized. *Research Institute of America, 292 Madison Ave., New York 17, N. Y.*

Standard for emergencies—Standardization in war time is the subject of this 11-page booklet. The role of standardizing in conserving materials and simplifying procedures during World War II is described briefly. Also considered are what standardizing may be expected in the present economic and military mobilization; work now going on in war standards; and some of the gaps that remain to be filled. *American Standards Association, Inc., 70 E. 45th St., New York 17, N. Y.*

Naval research activities—Items of interest to the plastics industry are included in two Commerce Dept. summaries of developments at the Naval Research Laboratory. Among the reports in the January 1951 issue of Bibliography of Technical Reports are discussions of the correlation of fungicidal activity with the chemical structure of organic materials, and shear strength of honeycomb-core sandwich constructions. The January Technical Reports Newsletter contains information on such topics as silicone lubricants, plastics and packaging in general, and abrasion resistance of nylon webbing. The Bibliography is available at 50¢ a copy, while the Newsletter is free on request—both from *Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D.C.*

Company history—A 32-page illustrated booklet gives an informative picture of some of the facilities, methods, and equipment of this 150-year old manufacturer of hydraulic presses and equipment. Special sections deal with various types of workers employed by the concern, and describe assembly, testing, and shipping activities. *R. D. Wood Co., Independence Square, Philadelphia 5, Pa.*

Small business and national defense—Taking the form of a series of questions and answers, the seven-page booklet "Selling to Your Gov-

ernment" provides a ready reference of basic data for the small-business man with little or no experience in selling his goods and services to the government. It contains who-buys-what information, procedure to be followed in establishing contact with buying offices, qualifications for selling services, and a list of sources within the government to which the small-business man can look for help. Prepared by the Senate Select Committee on Small Business; available through *The Society of the Plastics Industry, Inc., 295 Madison Ave., New York, N. Y.*

Presses, Bull. 290—Standard and custom-built presses for handling various materials are presented through illustrations and specifications in a 16-page bulletin. Included are standard steam platen presses (ranging from 20 by 20 in. to 84- by 222-in. platen size and from 100 to 12,500 tons capacity); plywood presses; equipment for the hardboard industry; heating plates; and hydraulic accumulator systems and Triplex Pumps. *The Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa.*

Transactions of The Plastics Institute—Papers presented before various sections of the organization and details of a technical conference are recorded. Topics covered include: development of a synthetic resin adhesive suitable for metal-to-metal bonding; electric heating in the molding industry; polyethylene; and symposium on synthetic finishes (cellulose, phenolic baking lacquers, and styrene copolymers). Available to non-members for 15 shillings post free. *The Plastics Institute, The Adelphi, Adam St., London, W.C.2, England.*

Electric radiant heater—The varied applications of the new Chromalox electric radiant heater provide the keynote of this illustrated broadside. The text explains how the equipment can be used for baking, drying, preheating, dehydrating, etc. Photographs show many of the uses of this "far infra-red" machine. *Edwin L. Wiegand Co., 7500 Thomas Blvd., Pittsburgh 8, Pa.*

Utilizing engineering manpower (Bull. 1)—A report by the Engineering Manpower Commission on the problems of government and industry



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Waterbury, Conn.

in selecting and utilizing its technical personnel, including procedures to be used in obtaining occupational deferments and delays for reservists and draftees. The critical shortage of engineers and the increasing demand for them in defense work makes this report of great value to many employers and users of engineers. Available for 25¢ from *Engineering Manpower Commission, 29 W. 39th St., New York 18, N. Y.*

Adjustable-speed calender drives—Drives for calendering rubber, plastics, and similar materials are described in an eight-page bulletin, designated GEA-5588, which includes dimensions and horsepower ratings of all of the company's calender drive motors and motor-generator sets. Illustrated by 19 photographs and a series of charts and diagrams, the booklet outlines the uses and advantages of the electronically-regulated drives. *General Electric Co., Schenectady, N. Y.*

Organic solvents—As a service to non-technical personnel and to acquaint them with the location of members of The Solvents & Chemicals Group, a 64-page handbook on organic solvents has been prepared. Information contained in the booklet covers definitions, comparison tables, testing methods, product descriptions, properties, and data on flash point, toxicity, dry time, and solvent powder. *Central Solvents & Chemicals Co., 2545 W. Congress St., Chicago 12. Ill.*

Tension linkages, Bull. 51-10—Chain applications in which linear movement of the chain is not continuous in direction are described in a new handbook. Numerous examples of tension linkage are shown and described. Various types of Baldwin Rex Roller Chains used in such applications are illustrated and cataloged. *Baldwin Duckworth Div., Chain Belt Co., Dept. PR., Springfield 2, Mass.*

Molded plastics in small lots—A new method for injection molding custom-made plastics products in small quantities is announced in a four-page brochure. In addition to keeping down production costs of precision plastics in small lots, the molder offers the following services: pilot runs where conventional tool cost would be prohibitive; sounding out the market for proposed designs; experimental and development work where redesign should be considered; production of scale models. The release assures an average mold life of 10,000 moldings through use of the new technique and states that sizes are limited to 2 oz. and 3 by 4 by 2 inches. Diagrams illustrate examples of molding in various thermosetting materials, giving cost data for different quantities. *Dayton Rogers Mfg. Co., 2824 13th Ave., Minneapolis 7, Minn.*

Flexible shaft machines—The complete line of flexible shaft machines available from this concern is outlined in a new eight-page catalog, No. 180-A. Claimed to be adaptable to every small-work operation of grinding, finishing, and deburring, the equipment listed ranges from heavy-, intermediate-, and light-duty models, through a variety of accessories, to complete kits and sets of flexible shaft gear. *Foredom Electric Co., 27 Park Place, New York 7, N. Y.*

Laminated plastics made with Bakelite phenolic varnishes—Fundamental information concerning various grades and types of laminated plastics ranging from sheet stock to plywood crossbanding are contained in this 42-page illustrated booklet. Methods of production and merchandising advantages are also included. Case histories of various types and grades in industrial service are given, together with test data on their physical, chemical, and electrical properties, and the methods employed in their fabrication and finishing. A list of representative manufacturers identified as to the various types of laminated plastics they produce is inserted. *Bakelite Co., Div. of Union Carbide and Carbon Corp., 300 Madison Ave., New York 17, N. Y.*

A Thirty Year History in the Lighter Vein—In celebration of 30 years of service in the field of chemistry and chemical engineering this firm has published a 32-page chronicle of its growth from a one-man organization to a firm with independent research, development, and testing laboratories and offices in many foreign countries. *Foster D. Snell, Inc., 29 W. 15th St., New York 11, N. Y.*



Hats, courtesy John-Frederics, Inc.

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There's glamour in Kodapak Sheet—genuine sales-slip glamour. Because it's completely transparent; because it adds such a jewel-like brilliance, the merchandise it encloses is enhanced with traffic-stopping appeal. Customers stop to look and buy what they see.

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Sales offices in New York, Chicago, Dallas. Pacific Coast distributor: Wilson & Geo. Meyer & Co., San Francisco, Los Angeles, Portland, Seattle. Canadian distributor: Paper Sales, Limited, Toronto, Montreal.

NEW MACHINERY AND EQUIPMENT

FAST, RIGID-LOCKING INJECTOR—The high speed of a small machine is combined with the rigid locking of a large unit in a new Lester injection machine, Model L-2-8 oz., introduced by Lester-Phoenix, Inc., 2711 Church Ave., Cleveland 13, Ohio. The new machine will mold 8 oz. of styrene or 10 oz. of acetate with an effective plunger displacement of 32 cu. inches. With its four pyrometers set at 600° F., the equipment has an hourly output of 80 lb. of styrene heated to 400° F.

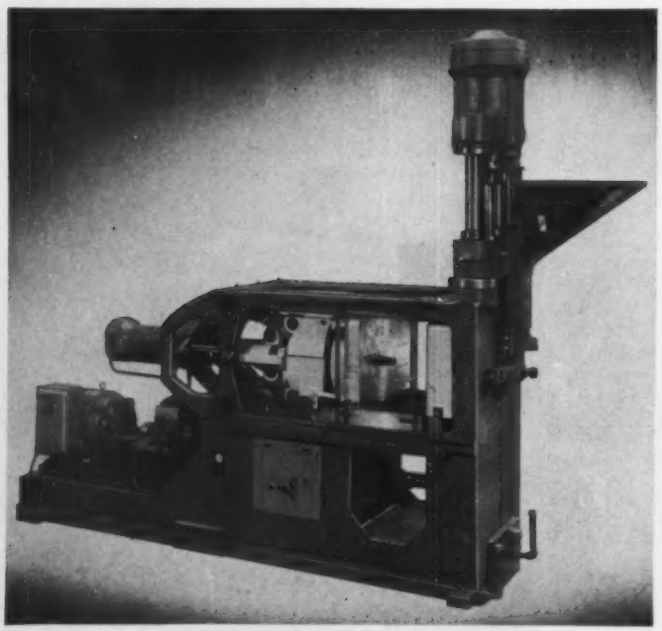
An improved internally heated injection cylinder enabled the machine in one case to run a 6-oz. styrene bowl at a molding temperature 100° lower than was possible on the older model 8-oz. equipment, and with a reduction in production cycle from 28 to 23 seconds.

L-2-8 has a locking tonnage of 350, which is checked through the use of strain gage equipment. Its die plate measures 22 by 28 in. (said to be large for an 8-oz. unit) and it can accommodate the standard 18- by 23½-in. DME mold base. The stationary die plate is supplied for either a 2- or 4-in. locating ring. Die space has been made completely accessible for clamping molds. The machine includes the solid frame and single-screw die-height adjustment characteristic of the Lester design, as well as a safety gate which provides the operator with positive protection against mechanical and electrical recycling. It is easily adapted to installation of the nylon cut-off unit.

CYLINDER MOUNTING—Quick, easy installation of air and hydraulic cylinders without the necessity for making actual pipe connections is the principal advantage of a new "O" Ring Cylinder mounting offered by Miller Motor Co., 4027 N. Kedzie Ave., Chicago 18, Ill. The air or hydraulic piping is directly connected to ports in a machined flat-surfaced mounting plate or manifold, and the cylinders are mounted on this plate with their ports mating in perfect alignment with the mounting plate ports. "O" Ring seals assure a leak-proof seal. The seal is pre-assembled into the cylinder port, thus eliminating the job of installing the ring separately.

Other features are: greater hydraulic fluid flow; minimum pressure loss; smoother flow; and elimination of turbulence and aeration.

Faster cycles and rigid locking are combined in this new 8-oz. injection molding machine



DUAL-SPRAY GUN—Materials which cure quickly when combined gain added life through use of a new paint-type spray gun that handles two solutions at the same time. The gun, Model 2S, is a product of Schori Process Div., Ferro-Co. Corp., 8-11 43rd Rd., Long Island City 1, N.Y., and was developed to handle materials that are stable in themselves, but that cure when mixed. Formulations can be sprayed that will be tack-free in 10 minutes. The Schori unit uses two pots and a spray gun with two nozzles. This keeps the solutions apart until they become atomized.

Special polyester resin formulations have been developed for use with this gun. For optimum results, a compressor should be used which delivers at least 15 cu. ft. of air per min. with a maximum line pressure of 70 pounds. Greater line pressure will increase the amount of resin mix sprayed. Applying line pressure directly to the gun is the preferred procedure.

CUTTING SAW—Greater depth of cut is the main advantage claimed for the Model R-2 radial receding arm saw designed by DeWalt, Inc., Lancaster, Pa. R-2, adaptable to the plastics, metal, and woodworking industries, is operated by a low dead-rise direct drive motor. Reduced interference of the bottom of the motor permits the arbor to be brought closer to the material being cut.

The cutter arm rides on eight double-row bearings. Locating latches allow rapid location of the cutting tool in any of the many cutting positions. The machine is pro-

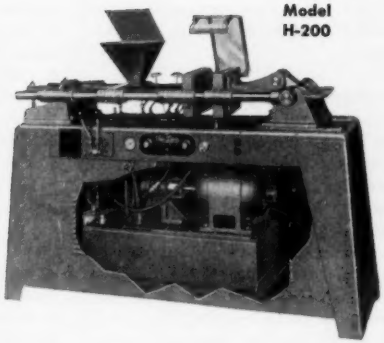
Model H-200



SEMI-AUTOMATIC INJECTION PRESS

2-oz. capacity. Van Dorn's engineering experience has scored again with this leader among all injection presses of its class. Its ultra-modern design insures faster operating cycles—up to 6 per minute. Push button controls are safe, simple and convenient. Accurate temperature regulation. Ruggedly built, compact and quiet.

Model H-200



Power Operated, Lever Controlled Presses—Available in 2-oz. or 1-oz. models. These profit-makers feature: Rugged all-welded construction; built-in safety devices; heating chamber with ample plasticizing capacity.

VAN DORN

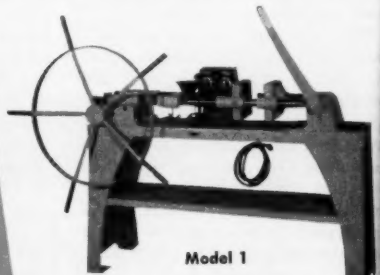
Plastic Equipment

COSTS LESS to Buy...to Operate!

Van Dorn presses are *unexcelled in efficiency* and *unequalled in economy* on the innumerable jobs where a 2-oz. injection is ample. Costwise, Van Dorn presses are outstanding for these reasons:

1. **Surprisingly low in price**
2. **Operate 8 hours for a few dollars**
3. **Use less expensive molds**
4. **Easily set up by one man in a few minutes**

These presses mold practically all thermoplastics including nylon . . . Look over the Van Dorn presses and plastic equipment shown—*then write for detailed Bulletins on individual machines.*



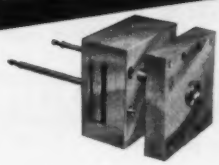
Model 1

Manually Operated Press
1-oz. capacity. Ideal for smaller jobs, experimental work, training.

Plastic Grinder
Grinds up rejects, waste, etc., for re-use. Ruggedly made, easily cleaned.



Model G-100



Mold Bases
. . . Available from stock for all Van Dorn presses.

THE Van Dorn IRON WORKS CO.
2687 EAST 79th STREET • CLEVELAND 4, OHIO
Cable Address: "VANDORN" Cleveland

duced in 3- and 5-hp. sizes, with 12-in. saws recommended for smaller models and 14-in. for the larger.

REVOLVING JOINT—Substantial power savings are made possible by the low torque of an improved-type revolving joint produced by Barco Mfg. Co., 1801 Winnemac Ave., Chicago 40, Ill. The new joint, designated Type IBR, is designed for use in making pipe connections to drum-type dryers, rolls, calenders, and other rotating equipment. Models are available for handling steam, oil, air, water, gas, and chemicals.

The rotating portion of the joint is a steel tube which screws into the hub of the drum or roll. The non-rotating portion is mounted on this tube through specially designed ball bearings which carry the load of both radial and end thrust.

IBR joints are built for 150 p.s.i. steam, or 200 p.s.i. hydraulic, and also for vacuum service. They are recommended for speeds up to 500 rpm. steam, or 750 rpm. hydraulic, and for temperatures up to 450° F. depending on packing specified. Standard sizes range from ½ to 2 inches. Body types include single and syphon or two-way flow models with straight and angle connections.

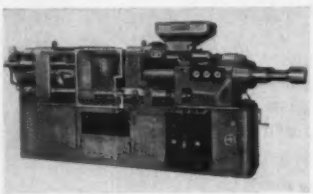
INJECTION MACHINE—Introduction to the American market of an injection machine operated by a piston pump and a hydropneumatic accumulator has been announced by Officine Ambrogio Triulzi, S.r.l., Via Giovanni da Procida N. 6-8, Milan 640, Italy. Advantages claimed for this system—which uses water instead of oil as the fluid agent, and derives the necessary elasticity and speed from the air-bag in the accumulator—are: it affords greater operational security; permits machines to be run at lower costs, with a motor rated at only 14 hp. In the case of compound installations involving several machines, a central station of two pumps having adequate power permits further savings in production costs.

The Triulzi machines, built entirely of steel, have a locking action effected by a hydraulic piston in three phases: 1) fast approach of the platen, achieved by a low pressure centrifugal pump; 2) clamping pressure of 2100 p.s.i.; and 3) an increase of this pressure to 4260 p.s.i. only during injection to compensate for back pressure caused by entrance of material into the mold. This arrangement, in addition to the "shock-absorber" which slackens the closing speed before the two halves of the mold come into contact, protects the equipment against overloading.

The high injection pressure of approximately 20,000 p.s.i. can be lowered through a pressure reducer acting only on the injection plunger in order to permit molding of any type of material. In addition, injection plunger speed is adjustable. The plunger slides in a nitrogen-hardened chamber made in a single piece and containing a torpedo. Extraction, performed automatically at the opening of the movable plates, is accomplished by central and lateral knock-outs.

An important feature on the equipment is the displacement of the fixed mold plate to break the slug. For this, the semi-stationary plate is moved by two small hydraulic pistons which retract it sufficiently to permit easy cleaning of the nozzle.

Another highlight is the filling operation carried out through a suitable hopper having a new rotating system for automatic feed control. The usual toggle mechanism has been replaced by a direct hydraulic



system to allow simple operation as the ram actuates the sliding mold plate. This is said to eliminate long and difficult adjustment when different molds have to be interchanged, and also avoids loss of time, as well as shocks which damage dies during clamping.

Specifications for the firm's Model 300 machine are: maximum oz. molded per shot (styrene), 11½; number of shots per min., up to 2; pressure on material, variable to 19,880 p.s.i.; locking pressure, 250 tons; frontal molding area, 140 sq. in.; opening pressure, 15 tons; movable plate run, 20 in.; maximum clearance between plates, 28 in.; and size of die plates, 17 by 27 inches.

HYDROSTATIC TEST PUMP—Versatility, simplicity, safety, and low cost are features claimed for the "aiROYmetric" pressure generator produced for a broad field of hydrostatic test applications by Milton Roy Co., 1302 E. Mermaid Lane, Philadelphia 18, Pa. The unit is combined with a group of specially designed controls to develop test pressures up to 25,000 p.s.i., using ordinary plant air supply in the pump cylinder. Each of the pumps develops a discharge pressure ratio of at least 6 to 1, permitting single pump use for applications requiring various test pressures. Units can be made for applications between 25 and 25,000 p.s.i. Capacities range from 4 to 405 gal. per hour.

The "aiROYmetric" is self-reciprocating and pumps continuously and automatically at maximum capacity in building up to desired pressure. When a balance is reached between the air pressure and the corresponding hydrostatic test pressure, the pump automatically stops.

SLITTER-REWINDER—Films ranging in thickness from 0.001 to 0.020 in. in widths as small as ⅜ in. can be slit and rewound on a new machine, Model 457, introduced by John Dusenbery Co., Inc., 271 Grove Ave., Verona, N.J. All adjustments for tension control can be made while the machine is in operation. Threading is easy: a simple device lifts blades away from the main roll.

Highlights of the equipment are: 1) A new design is incorporated in the rewind mandrels which permits control of core slippage while the machine is running; mandrels are locked axially to insure a smooth rewound edge. 2) Specially designed slitting blade holders allow easy and accurate adjustment for width of cut; an attachment for rotary burst-cut slitting is available. 3) Wrinkling of material is prevented by using sufficient idler rolls and a heavy rubber platen roll.

Specifications include: width capacities: 32, 42, 54, 62, and 72 in.; rewound diameter, 12 in. max.; core diameter of rewound roll, 1 to 3 in. to suit customer; parent roll diameter 20 in. max.; parent roll core size, 3 in. standard; and speed of web, 450 ft. per minute.

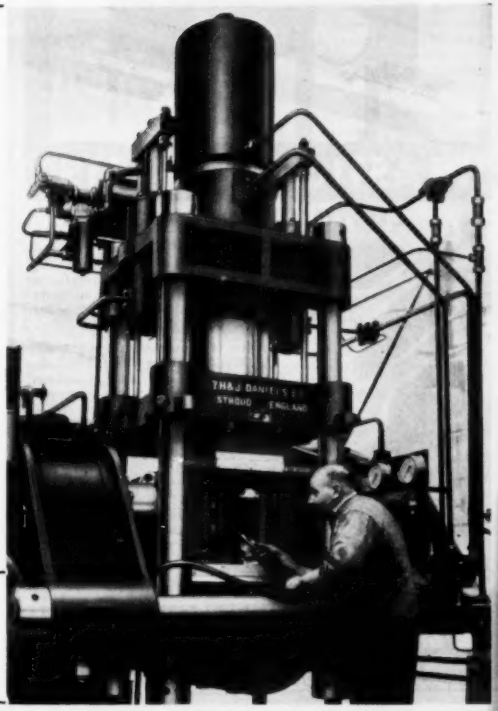
WHAT IS A SYNONYM?

In 31 countries, the word DANIELS is a synonym for reliable moulding plant.

OUR ADDRESS

IS ON THE PRESS

A 150/120 ton side ram press installed at A.B. Konstharts, Trelleborg, Sweden.





53 Mount Vernon, N. W., Grand Rapids, Mich.

Shawnee
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DRY COLORS

COLORS FOR PLASTICS

•

Strontium Chromate Yellow

•

Ming (Molybdate) Orange

•

Organic Red, Maroons
Blue & Green Toners

•

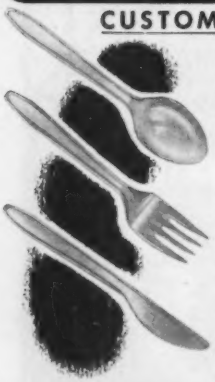
Red & Yellow
Cadmium Toners
(Subject to limitations of NPA Order M-19)

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CUSTOM MOLDING!



The plastic tableware you see illustrated here has been carefully molded to exact specifications . . . reinforced throughout to give the feel and service of regular silverware both in size and shape.

But this is conventional type design . . . We CUSTOM MOLD delicate designs, novel designs and unusual designs . . . many of our customers have us mold their intricate trademarks, slogans and logotypes into this plastic tableware and they're very particular about the finished product too!

• • •

When your ideas demand plastic products of ANY TYPE where **precision is your hallmark and low cost your goal.**

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PLASTIC PRODUCTS



Everyone agrees on the Model 6002 Mold Temperature Control Unit — the new self contained dual unit consisting of two independent heating, cooling and circulating systems in a single portable unit. Exclusives include high hose connections, fast water circulation, easy to see and reach controls and dials, plus modulating cooling controls. Efficiently adapted to large or small molds — ready to operate, just connect to source of electric power, cold water and drain.

MANUFACTURERS OF TEMPERATURE CONTROL EQUIPMENT SINCE 1916

Sterlco Model 6002
MOLD TEMPERATURE CONTROL UNIT
INDUSTRIAL CONTROL DIVISION
STERLING, INC.
3736 N. Holton Street • Milwaukee 12, Wis.

Production of

FOR the purpose of this report, production is the sum of the quantities of materials produced for consumption in the producing plant for transfer to other plants

PLASTICS AND SYNTHETIC RESIN PRODUCTION
From Statistics Compiled

Materials	*Total prod'n. first 2 mos. 1951*	*Total sales first 2 mos. 1951*
CELLULOSE PLASTICS:[a]		
Cellulose acetate and mixed ester plastics:		
Sheets, continuous:		
Under 0.003 gage	2,623,608	2,578,249
0.003 gage and over	2,117,125	2,158,344
All other sheets, rods, and tubes	1,002,180	1,104,010
Molding, extrusion materials	13,006,641	11,964,973
Nitrocellulose:		
Sheets	1,200,401	1,137,087
Rods and tubes	197,364	242,001
Other cellulose plastics[b]	2,390,312	2,357,528
PHENOLIC AND OTHER TAR ACID RESINS:		
Laminating	13,709,997	9,945,047
Adhesives	7,306,739	6,450,929
Molding materials[a] (including casting)	39,685,062	35,211,365
Protective coatings (containing less than 10% modifier)	4,089,909	3,063,424
Miscellaneous uses	12,687,567	12,290,229
UREA AND MELAMINE RESINS		
Adhesives	16,043,539	15,080,831
Textile-treating resins	5,113,615	4,648,399
Paper-treating resins	2,281,609	2,161,050
Protective coatings, modified and unmodified	5,669,146	4,321,916
Miscellaneous uses, including laminating and molding[c]	13,793,076	11,757,969
STYRENE AND STYRENE DERIVATIVE POLYMER AND COPOLYMER RESINS:		
Molding materials[a]	36,663,712	35,549,958
Protective coatings, modified and unmodified	6,566,890	7,099,791
Miscellaneous uses	9,646,426	8,990,239
VINYL RESINS:		
Sheeting and film, including safety-glass sheeting (resin content)[d]		28,530,411
Adhesives (resin content)		1,761,754
Textile- and paper-treating resins (resin content)[e]		7,047,826
Molding and extrusion material (resin content)		21,049,284
Protective coatings (resin content)		4,508,283
Miscellaneous uses (resin content)		2,511,124
MISCELLANEOUS SYNTHETIC PLASTICS AND RESIN MATERIALS:		
Molding materials[a, f]	12,607,502	11,159,812
Protective coatings[g]	2,984,701	3,466,302
All other uses[h]	17,951,247	17,388,179

[a] Includes fillers, plasticizers, and extenders. [b] Includes sheets, rods, and tubes, and molding and extrusion materials. [c] Data on resins for laminating and miscellaneous uses are on a dry basis; data on molding materials are on the basis of total weight. [d] Prior to January 1951, statistics were given on the basis of total weight. [e] Includes data for spreader and calendering-type

Plastics Materials

of the same company, and for sale. Sales include only the quantities involved in bona fide sales in which title passes to the purchaser.

IN POUNDS FOR JANUARY AND FEBRUARY, 1951 by U. S. Tariff Commission

January 1951		*February 1951*	
Production	*Sales*	*Production*	*Sales*
1,458,754	1,477,760	1,164,854	1,100,489
1,164,999	1,199,811	952,126	958,533
530,424	527,869	471,756	486,141
7,205,014	6,251,881	5,801,627	5,713,092
643,193	650,925	557,208	486,162
87,040	134,869	110,324	107,132
1,334,089	1,211,758	1,056,223	1,145,770
7,513,404	5,446,922	6,196,593	4,498,125
3,679,687	3,179,880	3,627,052	3,271,049
22,026,414	19,323,600	17,658,648	15,887,765
2,280,713	1,605,456	1,809,196	1,457,968
7,628,367	7,326,945	5,059,200	4,963,284
8,956,213	7,881,290	7,087,326	2,199,541
2,652,147	2,203,932	2,461,468	2,444,467
1,082,337	1,000,060	1,199,272	1,160,990
2,783,274	2,118,913	2,885,872	2,203,003
7,180,869	5,443,355	6,612,207	6,314,614
19,484,478	18,386,998	17,179,234	17,162,960
3,899,250	3,706,689	2,667,640	3,393,102
5,109,011	4,603,059	4,537,415	4,387,180
	15,552,105		12,978,306
	994,102		817,652
	3,788,172		3,259,654
	11,133,269		9,916,015
	2,124,258		2,384,025
	1,263,791		1,247,333
6,693,191	6,697,903	5,914,401	4,461,909
1,509,594	1,680,928	1,475,107	1,785,374
9,601,838	9,459,787	8,349,409	7,928,392

resins. [f] Includes data for acrylic, polyethylene, nylon, and others. [g] Includes data for epichlorohydrin, acrylic, polyester, silicone and other protective coating resins. [h] Includes data for acrylic, rosin modifications, nylon, silicone, and other plastics and resins for miscellaneous uses.

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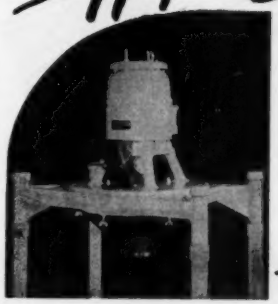
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Send for bulletin and reprint describing results on plastics applications.

ENTOLETER CENTRIFUGAL MACHINES

INTERNATIONAL PLASTICS NEWS*

Activities Around the World of Interest and Importance to the Plastics Industry in the United States

New packaging division—The Cascelloid Div., The British Xylonite Co. Ltd., London, has recently developed a special department to serve the packaging industry with transparent boxes, squeeze bottles and jars, and polyethylene bags. The Cascelloid Div. is one of the three manufacturing divisions of British Xylonite, which is one of the largest organizations in the plastics industry in Britain.

In addition to this packaging operation, Cascelloid manufactures toys, dolls, and rainwear at its three factories at Leicester, Coalville, and Stamford. The Halex Div. of the company, located in London, produces toilet brushes, combs, table tennis balls, and a wide range of injection and compression industrial moldings. The Scintellex Div. of the parent company, with a factory at Christchurch, will produce articles to be used by the fancy jewelry and buttons trades.

Universal Press—R. H. Windsor Ltd., London, has secured the sole manufacturing and marketing rights for the Jackson-Church Universal Hydraulic Molding Press in the United Kingdom, the dominions and colonies, Eire, India, Pakistan, and Europe.

Under the terms of an agreement with Jackson & Church Co., Saginaw, Mich., Windsor will produce and sell the 48-oz. capacity machine which, in its departures from conventional design, represents an entirely new development in plastics molding equipment. The new press makes use of an extruder pump for thoroughly pre-plasticizing the molding material and forcing it into the injection chamber; a vertical hydraulic press clamps the mold and injects the material into the cavities. Windsor will exhibit the first of these machines during the Festival of Britain and at the British Plastics Exposition, from June 6 to 16.

Although the primary purpose of the Universal Press is to mass-produce large injection molded pieces at high speeds and low cost, the machine can also be used for compression and transfer molding. Since the machine operates at relatively low pressures, because of the complete pre-plasticization of the molding material, it is light in weight and hence low in cost and inexpensive to operate.

Under severe tests, the machine is claimed to have produced strain-free moldings on cycles from 20 to 50% faster than conventional injection molding machines. The six main steps in molding—pre-plasticizing, feeding, clamping, injection, cooling, and opening—are all automatically timed. It is reported that the machine can handle 360 lb. of thermo-

(Continued on p. 179)

Only Complete Guide to Casting Techniques For Flexible, Semi-Rigid and Rigid Moulds

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MOLD-MAKING FACILITIES. Booklet describing in detail the facilities for designing and making plastics molds of every type. Illustrated with pictures of equipment, etc., B. I. P. Tools Ltd. (6-800)

FIRESTONE VELON FILM. Booklet containing source material on vinyl film which should be of interest to retail stores. Covers basic and specific advantages for many types of products into which Firestone Velon film is most commonly fabricated. Firestone Plastics Co. (6-801)

12-HYDROXY STEARIC ACID AND HYDROGENATED CASTOR OIL. Technical bulletins containing information about the composition and characteristics of these two chemicals which are suggested for use in plasticizers and coatings. Emery Industries Inc. (6-802)

SYNCLINAL SUMP-TYPE LIQUID FILTERS. Discussion of a line of filters for hydraulic equipment. Includes data on types, installation, and a guide for ordering. Marvel Engineering Co. (6-803)

TEMPERATURE MEASURING EQUIPMENT. Bulletin on Thermo Electric indicating and controlling pyrometers, thermocouples, connectors, etc. which are used in measuring and controlling the heat of various machines. Thermo Electric Co., Inc. (6-804)

STYRENE. Pamphlet outlining the history of Erinoid styrene, its electrical, mechanical, thermal, and molding properties. Also briefly covers the cementing, machining, painting, and lacquering of this material. Erinoid Ltd. (6-805)

FLASH REMOVAL. Reprint of a MODERN PLASTICS article giving details of a new low cost flash removal process for thermosets. American Wheelabrator and Equipment Corp. (6-806)

NON-ADHESIVE USES FOR TETRAFLUOROETHYLENE. Bulletin suggesting several applications for Teflon tetrafluoroethylene resin, based on its unusual non-adhesive properties. Polychemicals Dept., E. I. du Pont de Nemours & Co., Inc. (6-807)

STAFLEX QMXA STABILIZER. Data on Staflex QMXA, a stabilizer recommended for use in all vinyl compounds. Said to produce transparent products which are free from bloom and with excellent printing surfaces. Descy Products Co. (6-808)

ROGERS AND ITS FIBERLOYD. Pamphlet basically about various plastic laminated impregnated materials, but containing many philosophical and sometimes humorous asides on management, labor, advertising, etc. Rogers Corp. (6-809)

MOLDING PRESSES. Illustrations and specifications of several sizes of compression, transfer, and preform presses manufactured by T. H. & J. Daniels, Ltd. (6-810)

DRY COLORING PLASTISOLS AND ORGANOSOLS. Pocket-size leaflet containing a considerable amount of data on the technique of using dry coloring agents for vinyl plastisol and organosol resins, plus a list of Ferro dry colors which are currently available for this purpose. Ferro Enamel Corp. (6-811)

BATCH MIXERS. Folders containing information on a horizontal shaft ribbon-type mixer for mixing dry products and for blending liquids or semi-liquids with dry powder. R. N. Bailey & Co., Inc. (6-812)

TRITONS. Information on the use of these synthetic, organic, surface-active agents in de-inking, processing raw cotton and rags, increasing absorbency, softening paper, dispersing pigments, and other operations for the plastics industry. Rohm and Haas Co. (6-813)

SHEET FABRICATING EQUIPMENT. Descriptive sheet and price list on plastic sheet fabricating equipment including a bar folder, a single and double bar creaser, and a sheeter. Nyles Goodman Co. (6-814)

VINYL ACETATE RESINS. Description of the advantages and limitations of the many types of Vinylite vinyl acetate resins. Essential data on solution, viscosity, toughness, film strength, compatibility and softening temperature. Also information required to formulate these materials. Bakelite Div., Union Carbide and Carbon Corp. (6-815)

PLIOLITE S-6B. Techni-Guide on the properties, compounding, processing, and applications of Pliolite S-6B resin for reinforcing rubber. Chemical Div., The Goodyear Tire & Rubber Co., Inc. (6-816)

WIPE-IN KOLORS. Information on the use of colored materials which are employed to fill sub-surface depressed designs in order to make them more apparent and distinct. Lists various available colors. Keeler & Long, Inc. (6-817)

VACUUM COATING UNITS. Description and specifications of vacuum chamber units for coating plastic items with aluminum, copper, gold, and numerous other metals, paints, and alloys. Data on the technical service available. Distillation Products Industries, Div. Eastman Kodak Co. (6-818)

CEMENTING TECHNIQUE FOR STYRENE. Methods of application and types of cements used for Lustrex styrene moldings. Discusses bonding styrene to styrene and styrene to other surfaces. Plastics Div., Monsanto Chemical Co. (6-819)

UNIVERSAL TESTING MACHINES. Folder containing information on table model universal testing machines for volume production testing or laboratory research work. Machine tests tension, compression, flexure, shear. National Forge & Ordnance Co. (6-820)

"FLEXOL" PLASTICIZER 8N8. Specifications and physical properties of a plasticizer for vinyl chloride resins and for use in vinyl organosols and plastisols. Carbide and Carbon Chemicals Div., Union Carbide and Carbon Corp. (6-821)

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ELECTRIC HEATING UNITS. Catalog containing specifications and prices of many types of electric heating units including cartridges, strips, cylinders, hot plates, and immersion heaters with applications within the plastics industry. Watlow Electric Manufacturing Co. **(6-823)**

MULTI-SCREW EXTRUDER. Reprint from MODERN PLASTICS giving production and performance data on a meshed multi-screw compounder-extruder. Illustrations of many unusual types of extrusions. R. H. Windsor Ltd. **(6-824)**

MOLDING FACILITIES. Illustrated booklet giving details of the facilities available for molding thermoplastics and thermosetting plastics and for laminating and low pressure molding at the Cambridge plant of Continental Can Co. **(6-825)**

DATA ON EL PASO. Industrial and commercial information about the facilities for manufacture, distribution, transportation, and living in the Southwest in general, and El Paso in particular. El Paso Chamber of Commerce. **(6-826)**

WORK GLOVES. Bulletin illustrating many styles of heat- and flame-resistant work gloves, hand pads, and hand guards. C. Walker Jones Co. **(6-827)**

EJECTOR PINS. Catalog excerpt listing and pricing D-M-E ejector pins made of Nitralloy steel, and hotform die steel. Detroit Mold Engineering Co. **(6-828)**

POLYSIZE RESINS. Technical bulletin on the properties of Polysize emulsions which have applications in the finishing of every type of textile including cotton, rayon, nylon, silk, and linen. Includes methods for applying, formulas and finishing procedures, and properties of finished goods. American Polymer Corp. **(6-829)**

COLLOIDAL GRAPHITE. Technical bulletin pertaining to the application of colloidal graphite to industry. Gives information on colloidal graphite as a high temperature lubricant. Four pages. Acheson Colloids Corp. **(6-830)**

CALENDERS FOR THE RUBBER AND PLASTICS INDUSTRY. Standard and special two-, three-, and four-roll calenders for plastics, rubber, and floor tile. Adamson United Co. **(6-831)**

OFFSET PRINTING EQUIPMENT Specification and data sheets covering the use of offset printing equipment for decorating plastics in both odd and regular shapes. Apex Machine Mfg. Corp. **(6-832)**

INDUSTRIAL SCALES. Folder describes and illustrates group of scales designed for a wide variety of industrial weighing purposes. 4 pages. Detecto Scales, Inc. **(6-833)**

DOW PLASTICS. Illustrated brochure on the general line of Dow plastics including molding powders and products which are molded and extruded from them, packaging and sheeting materials, and synthetic textiles. 16 pages. The Dow Chemical Co. **(6-834)**

RESIN. The properties, solubility, compatibility with drying oils, etc., of Durez 220-V resin, a terpene phenolic, oil-soluble, high-melting, high-viscosity, thermoplastic resin for use in varnishes. Eight pages. Durez Plastics & Chemicals, Inc. **(6-835)**

RESIN-TREATED PAPERS. Brochure describing Phenopreg RP materials which are resin-treated papers that can be used in the surfacing of plywood, veneers, and various types of construction boards. Fabricon Products, Inc. **(6-836)**

MANUFACTURING FACILITIES. Information about the facilities and equipment for injection molding of plastics and for die casting aluminum and zinc is contained in this booklet offered by Tri-State Plastic Molding Co., Inc. **(6-837)**

PROCESSING EQUIPMENT. Data on a line of equipment of interest to plastics manufacturers. Includes crushers, mills, die batch mixers, batch blenders, air separators, and vibrating screens. Sturtevant Mill Co. **(6-838)**

ELECTRIC RADIANT HEATERS. Folder illustrating various applications of Chromalox radiant heaters as used for mold heating, drying sand cores, drying granular plastics, baking impregnated cloth, etc. Edwin L. Wiegand Co. **(6-839)**

VALVES. Folder showing a large variety of Atlas valves with applications in hydraulic equipment, steam and water lines, and similar uses. Atlas Valve Co. **(6-840)**

PLASTICS GRINDER. Data on the American "KC" rotary knife grinder reducing sprues, gates, rejects, and other thermoplastic scrap to homogenous granules. American Pulverizer Co. **(6-841)**

CADMIUM-TYPE STABILIZER. Technical service report on Witco stabiliser No. 40 for transparent film, sheeting, and extruded compounds made from polyvinyl-chloride type resins. Witco Chemical Co. **(6-842)**

INJECTION MOLDING MACHINES AND MOLDS. Detailed specifications on PECO 2-, 4-, 6-, 8-, and 16-oz. injection molding machines and the mold building facilities of The Projectile & Engineering Co. Ltd. **(6-843)**

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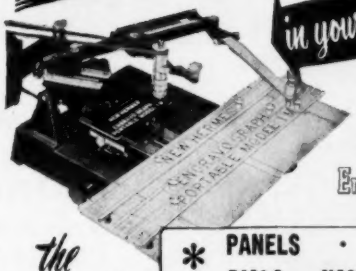
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New acetate plant—Hercules powder Co., Ltd., London, has become a partner in the acetate factory being erected at Lancaster, England, by James Nelson Ltd., Valley Mills, Nelson, Lancashire, and Erinoid, Ltd., London. Production at the new factory is expected to begin in the latter part of this year.

The output of the new plant, announced on p. 182, May 1951 MODERN PLASTICS, is expected to be absorbed as follows: Nelsons Silk, Ltd., will use supplies for rayon spinning; Erinoid, Ltd., will use the flake to replace acetate previously imported from North America for the manufacture of cellulose acetate molding material; Hercules Powder Co., Ltd., will use output for sale as acetate flake. The bulk of the sales of flake will be for export.

Chemical plant completed—The first units of the Grangemouth project of British Petroleum Chemicals, Ltd., have now been completed, and experimental production runs are being made. The first products available in bulk will be ethyl and isopropyl alcohols. The availability of these chemicals will reduce the need for imported materials, the shortage of which in the past six months has been an embarrassment to the solvents industry.

Plastics exhibition in India—More than 100,000 people attended the 1951 National Plastics Exhibition held in Calcutta from March 6 to 15. The exhibition was organized by Popular Plastic Products, Calcutta, under the patronage of the All India Plastics Manufacturers Association. Individual stands were occupied by 33 Indian firms, and material for the general sections of the exhibition was sent by more than 30 foreign firms.

Japanese Trade Fair—Japanese commodities of interest to American, Canadian, and South American buyers will be shown at the Japanese Trade Fair, to be held in Seattle, Wash., from June 17 to July 3. The Fair will be held in the Edmundson Pavilion on the campus of the University of Washington and will cover more than 60,000 sq. ft. of display space.

Among the products to be displayed are: cultured and imitation pearls; furniture; toys; cameras; binoculars; glassware; housewares; gift items; and jewelry.

The fair is being staged under the auspices of the State of Washington, the City of Seattle, the Port of Seattle, and other state and city groups. Additional information on the fair can be obtained by writing John M. Haydon, International Trade Fair, Inc., Central Building, Seattle, Wash.

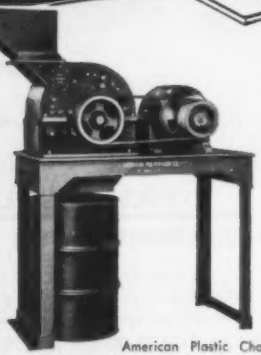
Large polyethylene container—The largest polyethylene container ever blown has been produced jointly by E. Shipton & Co., Ltd., and Industrial Appliances Ltd., both of London. The container, known as the Poly-Tainer, has a capacity of 80 ounces. It weighs only 1 lb. whereas a glass container of equal capacity weighs about 4 pounds.

The container is being used for shipping dangerous chemicals and drugs. Its cost is not competitive with glass, but the cost per journey becomes much less when the unbreakable plastic container is used as a return container.

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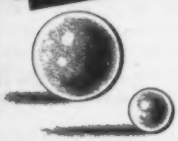
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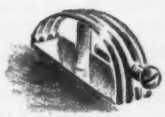
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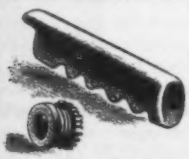
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Coffee Bowl Cover and Handle

NEW beauty and utility have been achieved by Cory Corp., Chicago, Ill., in its recently introduced Models EAB and ACB automatic coffee brewers by the adoption of a redesigned combination upper bowl cover and handle molded of special purpose phenolic material. Plastic parts for the cover, which are assembled with a stainless steel stamping that forms the lower surface of the cover disk, are molded by Globe Imperial Corp., Rockford, Ill.

For some time the company has recognized the need for an upper bowl cover which could be easily clamped into the bowl itself and would also function as a handle for removal of the upper bowl from the lower component of the brewer. This objective has been accomplished by combining two interlocking black phenolic parts with the steel liner, which has lugs that anchor it securely to the upper bowl with a slight turn. In the locked position, the cover has proved itself capable of withstanding a pulling force of more than 500 lb. without becoming separated from the upper bowl.

The two plastic parts include a skirted circular disk and a curved handle through which the fingers of the user may be slipped for a positive grip. Two machine screws with special heads hold the metal liner in position, screwing into metal inserts molded in the handle to join the two plastic parts. Directional ar-

Phenolic handle, top, fits into disk of same material to form bowl cover





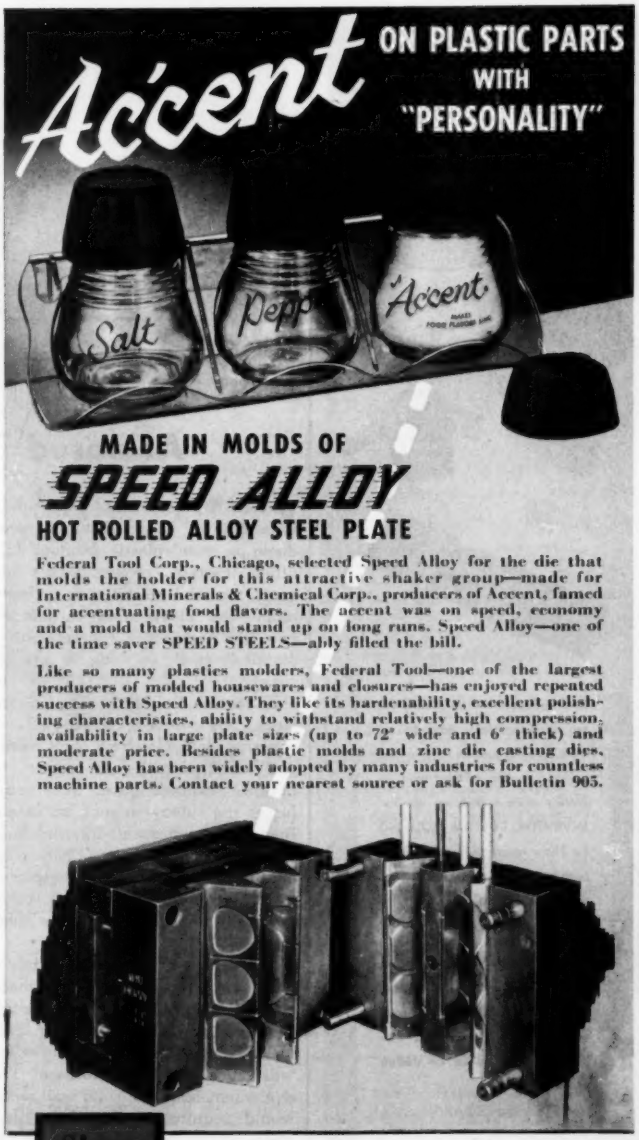
Other phenolic parts: bases for both bowls; decanter cover, handle, measure

rows molded in relief in the top of the disk component show which way to turn the cover to lock it in position or remove it from the bowl. The Cory name, debossed in the top of the handle, is filled-in with white for increased legibility.

The new cover not only provides a comfortable and heat-insulated grip for removing the upper bowl of the brewer, but also affords positive protection against spill-overs during the brewing operation. Two vent slots inconspicuously molded-in the edge of the cover, constitute pressure relief vents. The combination cover-handle can be easily stored when not in use.

Plastic parts for the new Cory brewer cover are molded of Durez 14690 phenolic material, a grade that is particularly resistant to heat, moisture, and oils. They are molded in a 12-cavity die in which the disk cavities are connected to the handle cavities by means of runners, providing a combination of compression and transfer molding. Oversized preforms are loaded in the disk cavities, with the result that, as the die closes, some of the material flows into the adjacent cavities, containing the threaded inserts to form the handles. This arrangement, it is explained, reduces die cost and provides a better molding cycle by a process of simplifying the loading operation.

The coffee brewer also has a hinged phenolic cover on the lower bowl. This component makes the decanter a unit complete in itself and obviates the necessity of moving the upper bowl cover to the lower bowl after brewing. Other phenolic parts on the automatic brewer are the lower bowl base and handle, the upper bowl stand, and a coffee measure.



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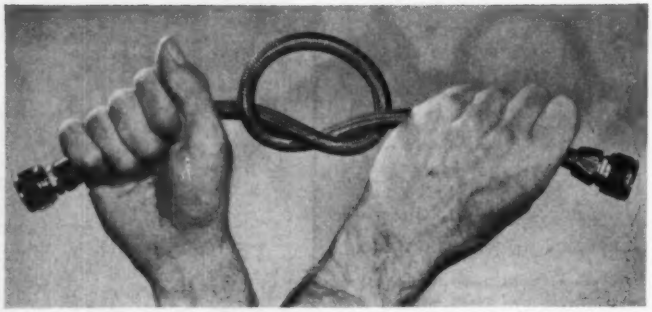
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Photos courtesy Hedeman Products, Inc.

Flexible steel-covered vinyl tubing offers time- and labor-saving advantages through its ease of installation. Vibration-proof properties make it less prone to cracks and breaks

Armored Vinyl Tubing

BRAIDING stainless steel over lengths of Koroseal tubing produces a metal-plastic product fulfilling certain requirements that each material could not achieve alone—the vinyl tubing is limited by low pressure characteristics; stainless steel is now in critical supply.

Hedeman Products, Inc., Great Neck, N.Y., developed the idea of covering B. F. Goodrich Co.'s Koroseal tubing with an armor of braided stainless steel. This reinforces the tubing to such an extent that it can withstand internal fluid or gas pressures up to 2000 p.s.i. and, therefore, is a suitable replacement for solid wall metal tubes made of copper, tin, stainless steel, and nickel.

The saving in critical materials is evident when a comparison is made between the total weights of metals required for 1000 ft. of tubing. Sixteen lb. of stainless steel braiding will cover 1000 ft. of Koroseal. The equivalent length of solid wall metal would require 63 lb. of stainless steel, 97 lb. of nickel, 118 lb. of seamless copper, or 250 lb. of blocked tin—materials which are, or will shortly be, on the critical list.

Because the armored tubing is nonporous, tasteless, and non-toxic, it is being used to carry beverages in such applications as soft drink fountain dispensers. For defense purposes, it is being adopted by many firms for use in gas, liquid, and air lines.

Good vibration-proof characteristics make the tubing suitable for use in lead lines in machinery. It absorbs vibration more readily than rigid tubing and is, therefore, less prone to leaks, cracks, or breaks. Installation is simple, because the flexible tubing can be bent or twisted around corners and curves and fed quickly through intricate ducts, thus providing economy in both time and labor.

In addition the translucent tubing resists abrasion, is not affected by acids, oils, alcohol, or lye, and has a working temperature range of 40 to 200° F. It does not crystallize, flake, rust, clog, stiffen, or peel.

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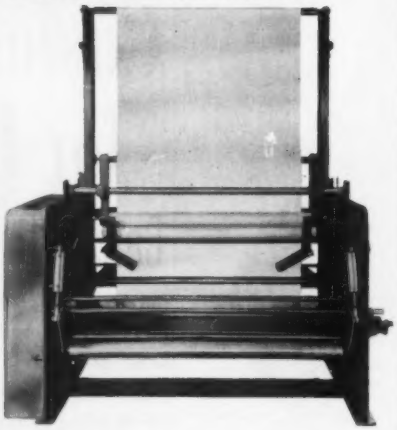
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Cigar Box

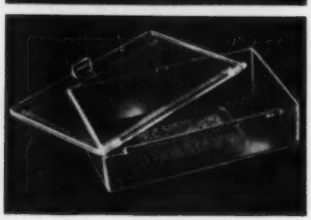
CIGARS have been added to the long list of products packaged in plastics. This newest package offers after-use values for either the smoker, as a small tool kit or fly box, or for his wife as a jewelry case or sewing kit. Webster Tobacco Co., New York, N.Y. has created this all-plastic hinged box molded of Dow Styron for its Perfecto Chico 10's package.

The hinge itself is plastic, with all of its components molded as part of the box. Two small projections molded on the bottom mate with two holes molded in lugs on the cover. The assembly consists simply of bending the cover of the box slightly so that the projections on the bottom snap into position in the holes on the cover. A protrusion is molded on the front of the bottom section in such a position that it snaps into an undercut hole molded in the front of the cover. This serves to hold the box closed. None of these undercut holes or lugs are molded by stripping; instead, each one is produced by a moving member in the mold. Pin point gated, these parts require no finishing after they are ejected from the mold.

The box is molded by Injection Molding Corp., Division of Whyte Mfg. Co., Inc., New York 3, N.Y. Promotion for the new item includes a spot on the ice hockey television programs from New York.

Polystyrene cigar box, with simple molded-on hinge, has many reuse values





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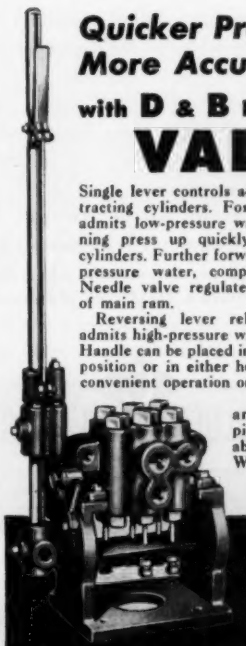
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Courtesy U. S. Rubber Co.

Life ring of expanded thermoplastic is said to resist fire, sun, salt water

Expanded Plastic

IMPORTANT qualities of lightness and sturdiness are found in a modified thermoplastic, Expanded Royalite, developed by United States Rubber Co., New York, N.Y. The new product—which can be used in life rafts, life ring buoys, and other flotation equipment, and in such applications as sun helmets and commercial fishing floats—is honeycombed with millions of tiny non-connecting cells which make it light in comparison with its bulk.

Expanded Royalite is said to be unaffected by sun or salt water, and will stay afloat indefinitely. Life rafts molded in one piece of the material can be made large enough to support 60 men. The honeycomb structure enables such rafts to float even after being punctured by strafing. Life rings made of the improved thermoplastic are claimed to be easier to handle than rings made of conventional materials.

Good thermal insulation properties qualify the material for applications requiring insulation coupled with structural strength. This property endures for long periods, since the thermoplastic has little or no moisture absorption. In addition, it has excellent dielectric properties.

U. S. Rubber manufactures the expanded thermoplastic in flat sheets which can be shaped by conventional thermoplastic forming techniques. It can also be molded to shape. Its density can be varied from 5 to 35 lb. per cu. ft., depending upon the application.



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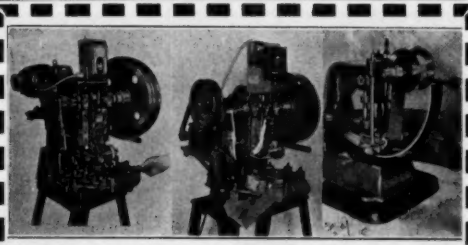
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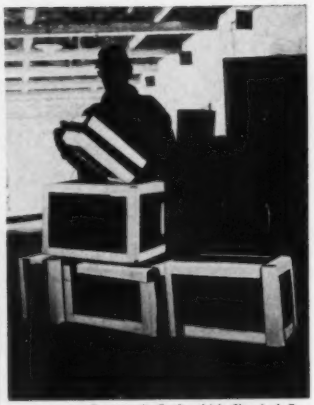
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Courtesy B. F. Goodrich Chemical Co.

Packages sealed with luminescent tape can be easily identified in the dark

Luminescent Tape

LUMINESCENT packaging tape which is easily visible in the dark at a distance of several feet has been developed by Century Coating Co., Whitestone, N.Y., to seal and mark boxes and containers of all sizes and shapes. Military applications are being considered.

A plastisol based on Geon paste resin, a B. F. Goodrich Chemical Co. product, is used as a coating for the "glowing" tape because it imparts toughness, abrasion and chemical resistance, and flexibility in all kinds of weather, and provides a moisture-proof coating for the luminescent pigment.

A spread coating unit lays on a succession of plastisol coatings in six passes; the top layer is a clear 2-mil film which covers a pigmented luminescent layer applied over base coats. After the various coatings have been applied, the 36-in. wide fabric is cut to a usable roll 4 in. wide. When not in use, the adhesive is protected by a covering which is easily stripped off.

Fire and toxicity hazards in the manufacture of the tape are reduced by the use of Geon plastisol because no solvents or diluents are required as are frequently used in fabric coating. In addition, cost saving advantages are reported because no grinding is necessary, expensive solvents and solvent recovery systems are eliminated, and compound mixing can be done in a short time.



Dishwasher parts are (l. to r.): top—butyrate housing, base, and tub, styrene utensils; bottom—butyrate housing braces, acrylic lid, butyrate brackets above decorative devices

Miniature Dishwasher

DURABILITY, ease of assembly, and attractive appearance were product requirements which led to the selection of a number of plastics for the manufacture of a miniature children's dishwasher by Topping Models, Akron, Ohio. Known as the Jet-Tower Junior Dishwasher, the toy is an accurate, small-scale duplicate of the Youngstown Kitchens dishwasher; it is equipped with chrome-plated dish baskets, a metal jet-tower in the center of the tub, and water intake and drainage hoses, which complete authentic reproduction of this appliance.

There are 14 plastics parts in the dishwasher, plus a complete set of 31 miniature plastics dishes and utensils. All parts were molded for Topping by Majestic Molding Co., Elyria, Ohio. Mullins Mfg. Corp., Warren, Ohio, is the distributor of the product.

Tenite II cellulose acetate butyrate was used for all components of the dishwasher except the lid. This material was chosen because of its impact strength and low moisture-absorption qualities. The chip-proof cabinet will give long service. Topping also chose butyrate for its ease of molding—thus holding assembly problems to a minimum.

The clarity and impact strength of acrylic were factors leading to the selection of Lucite for the lid. Model dishes and spoons are produced of styrene because of this material's satisfactory performance in filling small cavities.

Jet-Tower Junior is 10 in. high and 6¾ in. wide. When junior housekeepers want to operate it, they first arrange dishes and "silverware" in dish baskets and connect the intake hose to a faucet. Then the end of the drainage hose is placed in the sink. When the tap is turned on, the jet tower revolves and sprays the miniature plastic dishes and silverware with 64 jets of water.

Styrene dishes are placed in basket, are then sprayed from revolving tower

Courtesy Tennessee Eastman Co.



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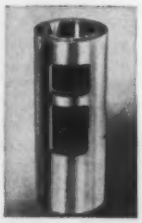
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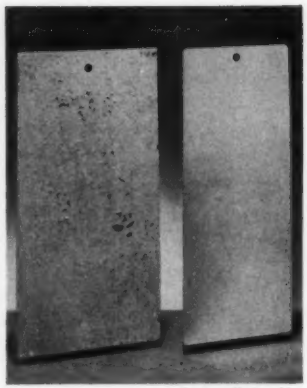
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Courtesy Plaskon Div.

Enameled (left) and silicone-alkyd coated (right) panels after heat test

Silicone-Alkyd

THREE silicone-alkyd coating resins—for which many military applications are foreseen by the producer because of their important properties—have been announced by Plaskon Div., Libbey-Owens-Ford Glass Co., Toledo, Ohio. The resins, designated Plaskon ST-856, ST-873, and ST-881, are declared to be the first commercially available combinations of silicone-forming components and alkyd resins.

ST-856 is a baking enamel for general industrial use where heat is deleterious to usual coating films, and where excellent durability is necessary. ST-873 is an air-drying resin which can be used for larger finishing areas than could be baked. It has potential use in consumer and maintenance paints, since it can be sprayed or brushed on. ST-881 is a vehicle for aluminum or similar pigment paints, and offers durability, flexibility, adhesion, and the ability to maintain its film properties when subjected to extremely high temperatures.

Heat resistance is the major merit attributed to the new compounds. Silicone-alkyd films are said to have greater resistance than most purely organic films. High gloss and stable color have been maintained by ST-856 and ST-873 in the range of 400 to 500° F., while ST-881 has shown no failure at temperatures as high as 1500° F.

Hardness and abrasion resistance



Courtesy Plaskon Div.

Testing durability and heat resistance of pipe with silicone-alkyd based paint

Surface Coatings

are claimed to be equal to or better than the best of the other alkyd combinations now in use. Adhesion and flexibility of a high degree can be had without sacrificing hardness or abrasion resistance. In addition, resistance of a silicone-alkyd film to organic solvents and strong acids is reported to be high, while its alkali resistance is rated equivalent to top-quality baking enamels.

Other favorable characteristics which are expected to recommend the new resins for military applications are excellent resistance to weathering, humidity, chemicals, and salt spray, plus satisfactory performance under widely varying climatic conditions. In one test for humidity resistance, ST-856 was found to be unaffected after 2000 hr. at 100% relative humidity and a temperature of 105° F. Exposure of the same coating resin to a 20% NaCl salt spray solution showed creepage of less than ¼ in. in 500 hours.

An important asset of the silicone-alkyd combination is its adaptability to single-coat applications, with the consequent elimination of primer coats and reduction of time, material, and labor costs. In such one-coat system, the firms display exceptionally good adhesion when applied to either treated or untreated steel. This factor is underlined by the producer as an economy advantage tending to offset, in part, the relatively higher price of the compound.

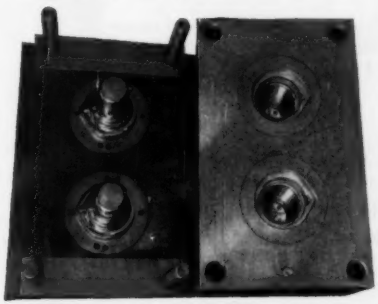
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Solution-Cast Film

(*Continued from pp.* 104-107)

The exact chemical resistance depends considerably upon the type and percentage of plasticizer used.

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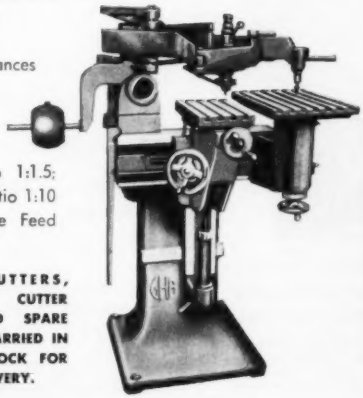
The authors wish to express their gratitude to Messrs. E. F. Smith and E. F. Schulz for their assistance in evaluating the properties of these films.

References

1. "The vinyl story," MODERN PLASTICS *26*, 70-73; *26*, 76-79; *27*, 92-95 (July, Aug., Sept. 1949).
2. "Vinyl inflatables become big business," MODERN PLASTICS *26*, 72-75 (April 1949).
3. "Nitrile rubbers as plasticizers in vinyl resins," by M. C. Reed, MODERN PLASTICS *27*, 117, (Dec. 1949).
4. "Military status of flexible packaging," by Charles A. Southwick, Jr., *Modern Packaging 24*, 121-124 (Nov. 1950).
5. "Vapor-phase inhibitors," *Modern Packaging 22*, 147 (Dec. 1948).
6. "Stiffness and brittleness of nonrigid vinyl chloride-acetate resin compounds," by R. F. Clash, Jr. and R. M. Berg, MODERN PLASTICS *21*, 119-124 (July 1944).
7. "Behavior of plasticizers in vinyl chloride-acetate resins," by M. C. Reed, *Industrial and Engineering Chemistry*, Vol. *35*, 896-904, (Aug. 1943).
8. "Behavior of plasticizers in vinyl chloride-acetate resins II," by M. C. Reed and Leonard Connor, *Industrial and Engineering Chemistry*, Vol. *40*, 1414-1422, (Aug. 1948).
9. "Behavior of plasticizers in vinyl chloride-acetate resins III," by M. C. Reed and James Harding, *Industrial and Engineering Chemistry*, Vol. *41*, 675-684, (April 1949).
10. "Resin - plasticizer systems - analysis of log stiffness-temperature and viscosity characteristics," by G. J. Dienes and F. D. Dexter, *Industrial and Engineering Chemistry*, Vol. *40*, 2319-25, (Dec. 1948).

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President, novelty manufacturer

"I have had another batch of inquiries from that ad. They are coming in from all over the country. I would say that I have just about heard from every state in the Union ... Your publication is really reaching the buyers ... It's just like finding gold on top of the ground."
President, novelty manufacturer

"Our ad in the first issue of *Plastics Merchandising* pulled excellent results."
Sales Manager, plastic housewares manufacturer

"We had over 200 inquiries on the product pictured in our advertisement in your January edition. These inquiries were all followed up ... So far 68 orders have been forthcoming."
President, large custom & proprietary molding company

"We have been besieged with initial orders from new accounts throughout the country of which many are attributed to your fine magazine."
Sales Manager, plastic film converter

"... inquiries are still coming in. As a matter of fact, we received more inquiries this week than in any one previous week since the issue went out ... We were very pleased with the reaction."
Advertising Manager, lighting fixtures company

"We are pleased to be able to advise you that the ad in the initial issue of *Plastics Merchandising* has already resulted in a very favorable number of replies. While complete returns on the advertising have not been reached, we have received about 75 inquiries to date."
Manager, Merchandise Div., proprietary molder of dinnerware

"... we've been too busy around here, answering inquiries and shipping orders, to write to you sooner. I guess that's as good an answer as one could want regarding reaction."
President, novelty manufacturing company

"... approximately 50 inquiries ... We are pleased with the results."
Sales Manager, toy company

"To date we have received a total of 42 replies to our ad."
Ass't Sales Manager, garden hose manufacturer

"It becomes an effort to try to catch up with the mail ... We would like to give you further details, but please believe us, we are so busy that we cannot take time out. All in all, we are well satisfied."
President, plastic film distributors

"... we have received approximately twenty inquiries as a result of our ad in the first issue of *Plastics Merchandising*, along with three orders and four requests for samples."
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"It gives me great pleasure in congratulating you ... The first issue of *Plastics Merchandising* has brought in many, many inquiries about our product. These inquiries have come from all over the country and Canada ... It has opened the door to many new customers."
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Shortcuts

(*Continued from pp.* 126-7)

Appendix B

<u>Weight per 1000 ft. (lb./M ft.) of a rod.</u>

Taking formula (5) in Appendix A:

(5) $W = f \times (OD + ID) \times (OD - ID)$

Since we have a rod, we can regard the ID as being infinitely small.

Hence ID = 0. The formula now reduces to:

(6) $W = f \times (OD)^2$

The values for f will be the same as in Appendix A.

Appendix C

<u>Weight per 1000 ft. (lb./M ft.) of a rectangular section.</u>

Taking formula (3) in Appendix A:

(3) $W = \frac{V_2 \times (2.54)^3 \times S}{453.6}$

Now the volume of any rectangular section is

(7) $V_2 = a \times b \times c$ .....where

a = width in inches
b = thickness in inches, and
c = length in inches

Now $c = 12 \times 1000$, since we are determining the weight per 1000 feet.

Hence

$V_2 = a \times b \times 12{,}000.$

Substituting in (3):

$$W = \frac{a \times b \times 12{,}000 \times (2.54)^3 \times S}{453.6}$$

$$= 433.52 \times a \times b \times S, \text{ or}$$

(8) $W = F \times a \times b$ .....where

$F = 433.52 \times S$

We can now make a chart for various plastics:

Type plastic	Av. S	$433.52 \times S = F$
Acetate	1.33	576.6
Butyrate	1.23	533.2
Methyl meth.	1.19	515.9
Ethyl cell.	1.11	481.5
Nylon	1.14	494.2
Styrene	1.05	455.2
Polyethyl.	.92	398.8

Type plastic	Av. S	433.52 × S = F
Vinyl	Variable	*
Phenolic	"	*
Urea formaldehyde	"	*
Others	"	*

*Because of the many formulations and resultant variations in specific gravity, F must be calculated for each of these materials.

Appendix D

Weight per 1000 pieces (lb./M pcs) of any size cubic.

Taking formula (3) in Appendix A:

$$(3)\ W = \frac{V_2 \times (2.54)^3 \times S}{453.6}$$

In this instance

$V_2 = a \times b \times c \times 1000$, since we are determining the weight of 1000 cubes.

Substituting in (3):

$$W = \frac{a \times b \times c \times 1000 \times (2.54)^3}{453.6} \times S$$

$= 36.127 \times a \times b \times c \times S$, or

$W = G \times a \times b \times c$ ..... where

$G = 36.127 \times S$

We can now make a chart for various plastics::

Type plastic	Av.S	36.127 × S = G
Acetate	1.33	48.05
Butyrate	1.23	44.44
Methyl meth.	1.19	43.00
Ethyl cell.	1.11	40.10
Nylon	1.14	41.18
Styrene	1.05	37.93
Polyethyl.	.92	33.24
Vinyl	Variable	*
Phenolic	"	*
Urea formaldehyde	"	*
Others	"	*

*Because of the many formulations and resulting variations in specific gravity, G must be calculated for each of these materials.

Appendix E

Weight per 1000 pieces (lb./M pcs.) of any other shape.

Taking formula (3) in Appendix A:

$$(3)\ W = \frac{V_2 \times (2.54)^3 \times S}{453.6}$$

Now, since we are determining the weight of 1000 pieces,

$V_2 = V \times 1000$ ..... where

V = volume of one piece in cubic inches.

Substituting in (3):

$$W = \frac{V \times 1000 \times (2.54)^3 \times S}{453.6}$$

$= 36.127 \times V \times S$ (see appendix D)

$= G \times V$ (see appendix D)

The values for G will be the same as in appendix D.

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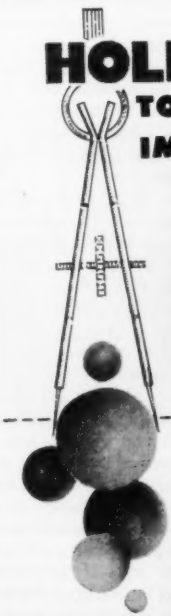
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Vinyl Resin Study

(*Continued from pp.* 129-140)

fusion also vary to a lesser extent with composition. In practice it is often advisable to formulate organosols with slightly more dispersant than called for by the minimum viscosity composition. This provides a factor of safety to off-set the slow penetration of dispersant into the resin which may occur upon aging, and minimizes the danger of flocculation which is more likely to occur in dispersant-lean systems.

Discussion of Results

The most significant observation to be made from all of these viscosity-composition studies would seem to be the existence of rather definite minimum viscosity points on practically all of the curves. This seems to be basic, and must have some physical significance in terms of the colloidal phenomena that take place. As a matter of fact, two distinct types of viscosity minima are shown: those in which the ratio of dispersant to diluent is varied, and those in which the dispersant-diluent ratio is held constant and the ratio of aromatic to non-aromatic diluent is varied. Furthermore, these phenomena are reversible, providing good grinding has been obtained, and organosols can be changed back and forth from dispersant-lean to dispersant-rich or to balanced compositions by addition of the proper liquids.

The variation in viscosity with change in proportion of dispersant suggests that surface adsorption effects come into play. It is considered significant that those compounds having very little true solvent action on the resin at room temperature seem to make most satisfactory dispersants, and that the more active solvents are less satisfactory, producing sharper viscosity-composition curves and tending to cause more rapid increase in viscosity upon aging. The molecular design of these better dispersants is suggestive of the balance between hydrophilic and hydrophobic groups which is needed in surface active agents in aqueous systems. In other words, a good dispersant should have a solvating group capable of adsorption on the resin surface, and non-solvent groups sufficient to prevent excessive penetration and swelling of the resin particle.

The effect of aromatic-aliphatic balance in the diluent seems to be to control the swelling of the resin particles and to regulate the solvent action of the dispersant on the resin. The swelling action of aromatic hydrocarbons has been demonstrated by several independent types of experiments, and is borne out by the higher viscosities of organosols rich in aromatic thinner. Thus, the aromatics show some of the properties of dispersants but lack any true stabilizing or peptizing action. The naphthenic hydrocarbons have almost no swelling action, while the aliphatics have none at all. It is thought that once the particles of resin are deflocculated, the viscosity of an organosol is determined largely by the amount of swelling of the particles, either by the dispersant or the aromatic hydrocarbon. There is evidence that organosols containing some aromatic hydrocarbons have greater practical usefulness because of their superior film-forming properties and ease of fusion during baking, so that in specific instances it is advisable to determine the minimum proportion of aromatic needed for the particular application at hand.

Studies of a more fundamental nature have been made and, in fact, are still in progress in an effort to obtain a better understanding of the colloidal phenomena involved. It has been demonstrated that the resin particles in an organosol carry a negative charge and will migrate towards the anode under an applied potential. Furthermore, they will tolerate the addition of rather large proportions of salts and other ionizable materials with only minor effects on viscosity. Measurements in a modified Bartell cell show that at the viscosity minimum point the thickness of the adsorbed liquid layer around the resin particles is at a minimum. Various other types of measurements also indicate pronounced changes in the minimum viscosity range, and leave little doubt of its fundamental importance. To elaborate upon these is beyond the scope of the present paper, but it is our hope that the data presented will provoke discussion and further work in this neglected field embracing organic colloid chemistry.—END

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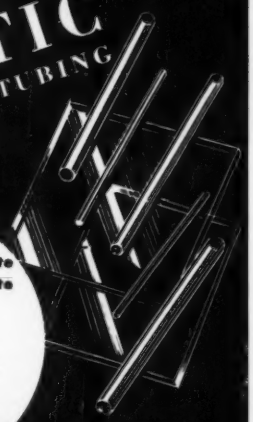
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...been demonstrated that the resin particles in an organosol carry a negative charge and will migrate towards the anode under an applied potential. Furthermore, they will tolerate the addition of rather large proportions of salts and other ionizable materials with only minor effects on viscosity. Measurements in a modified Bartell cell show that at the viscosity minimum point the thickness of the adsorbed liquid layer around the resin particles is at a minimum. Various other types of measurements also indicate pronounced changes in the minimum viscosity range, and leave little doubt of its fundamental importance. To elaborate upon these is beyond the scope of the present paper, but it is our hope that the data presented will provoke discussion and further work in this neglected field embracing organic colloid chemistry.—END

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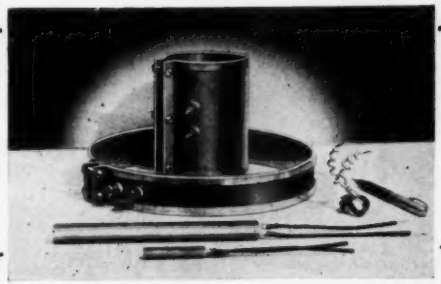
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Defense Machine

(Continued from pp. 87-93)

claims that he can impregnate plastic film with the nitrite chemical and thus the plastic film becomes the base carrying vehicle for the anti-corrosive chemical; film might even eliminate the need for paper or cloth as a ply in the laminated wrapper. Still another angle is that degreasing compounds often used in removal of cosmoline sometimes attack plastic parts such as bayonet handles of thermoplastic. Without cosmoline there would be no need to worry about such a possibility.

One of the outstanding packaging industry accomplishments in World War II was V-Board. This almost waterproof kraft board and plastics material was made into shipping containers that could be dumped overboard and floated ashore. These containers were a rousing success. Constructed of melamine-containing kraft and sealed with urea and polyvinyl alcohol adhesives, V-Board is now on large scale procurement again. Last July some 3000 tons of container board went into V-Board; procurement is now running around 25,000 tons a month which is about 5% of total container board production. In war-time, production of V-Board has been as high as 100,000 tons monthly. The amount of melamine and urea involved in the present V-Board program is close to 350,000 lb. a month.

The use of thermoplastics in packaging has been emphasized here because war-time applications have heretofore played such a large part in the increasing use of plastics for commercial purposes. The present emergency will likewise add all sorts of experience and knowledge that may be applied far beyond the packaging field. Much experience will be gained in such things as the use of a combination of plastics in one application; plasticizer effects; sealing techniques; adhesive properties; thermoplastic laminating; and probably even improvement of the properties of the raw material as producers seek to meet special requirements.

Big-Volume Plastics

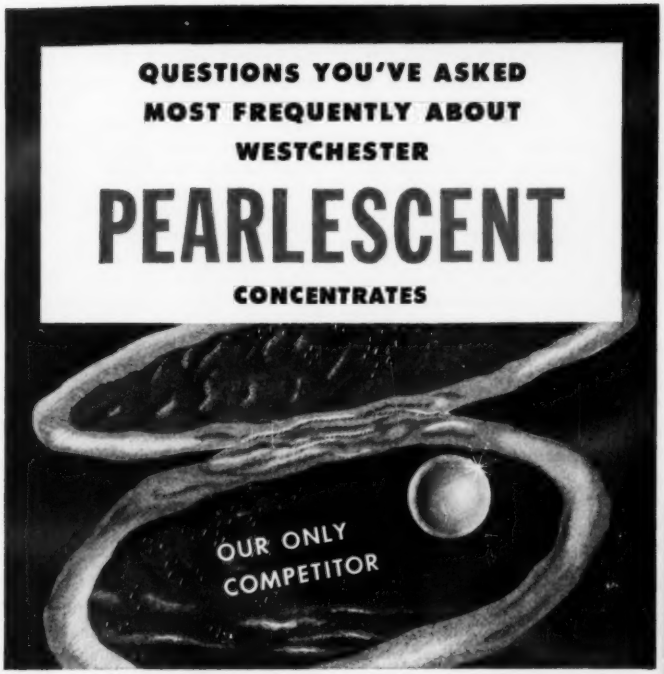
The story on the use of the big-volume thermoplastic molding compounds in war work is quite differ-

ent. Cellulose acetate may yet reach big volume use in the rocket and missile program, but as yet no large-volume use for molded polystyrene has developed. Most talked-of application for polystyrene today is in expendable spoons issued to soldiers in ration kits—one per soldier per meal. These spoons run about 80 to the pound. So far, counting the 70 million or so ordered in the past 12 months and those now on order, they will account for around 2 million lb. of polystyrene.

There is a great lot of talk about other possible polystyrene moldings for mines, missiles, and other secret items, but the latest word is that such items, if molded from styrene, are much more likely to turn up in high impact or copolymer styrene provided something can be done to reduce brittleness at low temperatures. Even the more simple housekeeping items such as salt and pepper shakers or waterproof match boxes seem to be preferred in the higher impact material. Another possibility is a thin, 3-compartment polystyrene molded food tray to be used in ration kits. Styrene-butadiene-rubber shoe soles and phenolic-rubber molded heels are also on the Defense Dept's. investigation list.

Cellulose acetate butyrate moldings, although still low in volume so far as DO orders are concerned, are beginning to show increased volume. They are currently in use as dehydrator plugs used in engines during shipment, control handles and knobs, tool handles, belt buckles, rocket components, and blackout filters for automotive headlights. One of the biggest butyrate applications in World War II was its use with duck in compression molded bayonet scabbards. Such scabbards are not yet on procurement for the present emergency. Another similar application is the machete sheath molded from polyvinyl-butyral impregnated duck—the butyral imparts flexibility.

Compression molded thermosetting parts, although in great demand all through the last war, are slow getting started in the current emergency. Most people believe the delay is due largely to the time required for starting the tank, ordnance, and airplane program. Some small parts for flame throwers and



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explosive containers are on order; the demand for electrical equipment that requires thermosets is still to come; scarcely any small arms or ammunition requiring phenolics have been ordered.

The frangible bullet containing lead and phenolic has been discontinued at least for the time being. There is as yet no indication that the M-52 will be revived. One procurement man says that if the thermoset fuse is revived, it may well be in a polyester or some other material than phenolic. Phenolic grips and handles for various small arms are still called for in specs, but some of the researchers are reinvestigating their resistance to shattering at extremely low temperatures. One interesting idea proposed is a metal gun stock with a plastic coating; another involves polyester rifle stocks and pistol grips.

There are interesting possibilities for compression molding in the new high strength, light weight helmet liner still in experimental development. The new helmet liner which is low pressure compression molded with a plasticized nylon fabric as the reinforcing material could supersede the present liner which is compression molded from a phenolic-macerated duck material. A phenolic-duck fireman's helmet weighing 24 oz. is now standard, but an alternate made from polyester-glass fiber is provided for.

Nylon now seems to have taken the lead as the most favored material for the Armed Services body armor—flak suit—flak curtain program which has been under study since 1943. Details are kept secret, but enough information has leaked out to indicate that although polyester-glass is still in favor for rigid armor, greater emphasis is now being placed on a more flexible material.

The nylon plies are no longer quilted as described in this magazine in 1945, but are joined together by lamination. Next to nylon, the other most favored reinforcements for this job are Orlon, Fortisan, and other synthetics.

Another laminating job on which there has been continuous research since V-J day are the melamine-glass and silicone-glass laminates used for electrical panel boards on Navy ships. The melamine laminate is now more widely used in this application for various reasons including economics and less tendency toward delamination. The Navy expects to have a melamine-glass laminate soon that will cost only half as much as the present job. But the use of silicone-glass tape for insulation on motors is rapidly expanding—technicians say that a motor wound with silicone insulated tape will last far longer than motors having conventional insulation, especially when exposed to a great deal of moisture.

Sheet Materials

Plastic sheet materials for use in this emergency are much the same as those used in World War II. Acrylics, both straight and laminated, are a necessity for war planes; such applications were fully described in this magazine in April. Acrylic sheet is being acquired for glazing in Quonsets. An acrylic screen protects the lookout on the deck of a submarine.

Acetate sheet is widely used for goggles and side curtains. Several million acetate trays 0.007-in. thick

(*Continued on p.* 205)

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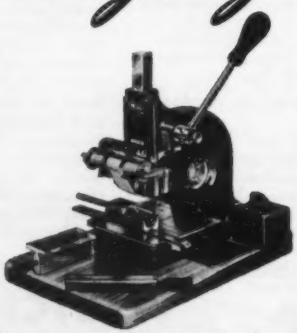
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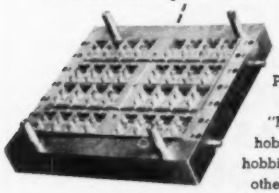
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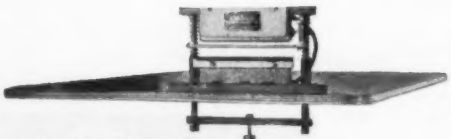
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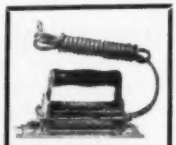
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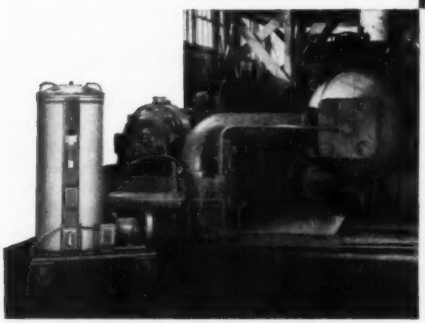
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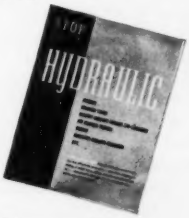
● This 69-ton, 300-ounce Watson-Stillman press accommodates dies up to 72" x 48". One of 14 injection molding machines at Amos Molded Plastics, Edinburg, Indiana, it employs a 7½-ton, 550 gallon hydraulic oil pumping unit (shown above being serviced by Honan-Crane Oil Purifier). Hydraulic equipment at Amos Plastics has been protected by Honan-Crane Purifiers since 1942.

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have been acquired as expendable items to fit in the melamine food trays used in hospital trains and planes. The tray is molded from sheet over wooden molds to fit the compartments in the permanent tray and then thrown away after the patient has eaten his food. The idea is to eliminate dish washing in cramped quarters. It is believed that this tray could be formed from the warm extruded sheet by vacuum molding and thus produced at a faster rate than at present. Polystyrene sheet has been tried for this purpose, and it is thought that acetate, polyethylene, and rigid vinyl would all be satisfactory.

A cast allyl sheet is now provided for in the specs for watch crystals and other instruments where hardness and good optical qualities are essential. Flexible polyester sheet is under experiment for side curtains on jeeps.

Another sheet application that has come into high repute since the Korean fracas began is the vacuum molded map. Over 36,000 relief maps of Korea had been molded from rigid vinyl by Feb. 1 and used in Army echelons as low as regimental headquarters. In case of a large scale war, hundreds of thousands would be required. The maps already made are 24- by 26-inches. The sheet is 0.015 in. thick, and ½ lb. of vinyl is used per map. Five maps can be molded in 1 min. by two operators. Acetate, butyrate, plastisols compounded with nitrile rubber, and Boltaron, a styrene-acrylonitrile copolymer with an inorganic filler, are all possibilities for this process of map making.

An important factor in the success of the molded map has been the development of a new scratch-proof Peerless printing ink based on a newly developed slow drying vinyl solvent for off-set lithographic printing. The next step will be the development of a flexible relief map which can be rolled for pocket or portfolio. The present trouble with such a map made from unsupported vinyl elastomeric film is that it lacks sufficient recovery—the hills and depressions have to be straightened out by hand after the map is unrolled.

The rigid vinyl maps cost the government only one or two dollars to produce in comparison to the former hand-painted plaster or sponge rubber maps that cost $1000.

Uses for plasticized vinyl in the defense program are currently confined largely to coated fabric and wire coating. Among the latest items for which negotiated contracts are being let is one for 5 million yd. of nylon fabric to be vinyl coated on both sides and used in ponchos. Vinyl-coated nylon ponchos were one of the outstanding plastics triumphs of the last war and are now standard. They are generally spread-coated.

Vinyl-coated duck has the largest potential in the field today insofar as coated fabric for war use is concerned. Most of the duck in use today is treated with chlorinated paraffine and antimony oxide for fire resistance. The finished material is used for tentage and tarpaulins. Continuous experimentation is going on to develop a vinyl coating that may supersede or at least supplement the chlorinated paraffine treatment. The vinyl not only provides fire resistance and longer life but would also reduce the coating weight by one half.

Some 30 million yd. of paraffine-

coated duck is scheduled for procurement in the fiscal year 1951 in comparison to a little less than 5 million yd. of vinyl-coated duck. The production potential in case of global war may be estimated from a contract in 1944 which called for a 400 million yd. delivery of coated duck from one company alone.

Vinyl-coated duck so far acquired is being used largely for the 16- by 16-ft. semi-permanent sectional tent used in Arctic regions. Each tent is a sandwich construction consisting of fibrous glass insulation to which coated duck is laminated on both sides. Total weight is 2200 lb. without the floor. A smaller and lighter five-man tent of vinyl-coated duck weighing 57 lb. is also on procurement. Another item is a vinyl-coated lining for a portable airplane hangar which was described in this magazine last January. Only a few companies are involved in these jobs. One reason is that cotton duck is so scarce only a few firms have it available. Another reason is that some companies have salesmen who are skilled and experienced in obtaining government contracts.

Armed Service uses for vinyl film and sheet have been slow developing. The Engineers, for example, have been working ever since 1946 on the possibility of using vinyl film to replace burlap for camouflage purposes. Greatest drawback is light reflection; it is possible that various types of embossing, flocking, creping, and perhaps ventilation may whip this problem. The cord or netting for camouflage may also go synthetic one of these days. Saran monofilaments and plastic-coated yarns are possibilities.

Vinyl sheeting is currently used for upholstery in some officers' quarters in garrisons; in seat covers for jeeps and tanks; as covers for tanks while they are being shipped from factory to the front; for phosphorescent colored panels used in air-ground identification; for use, when impregnated with lead, as protective clothing in atomic plants; for protective clothing by workers around jet engines.

A long-time experiment is still under way in the use of 4-mil vinyl film for Army raincoats. Specifications now call for rubber-coated raincoats because of unsatisfactory performance by some vinyl-coated raincoats during World War II when good plasticizers were unavailable. Present tests are particularly aimed at determining performance of both regular and low-temperature formulations during long exposure to cold rain. Correct plasticization may eventually overcome the low-temperature weakness. The desire is for film rather than a coated fabric, because film would eliminate dependence upon scarce cotton sheeting and is also light in weight.

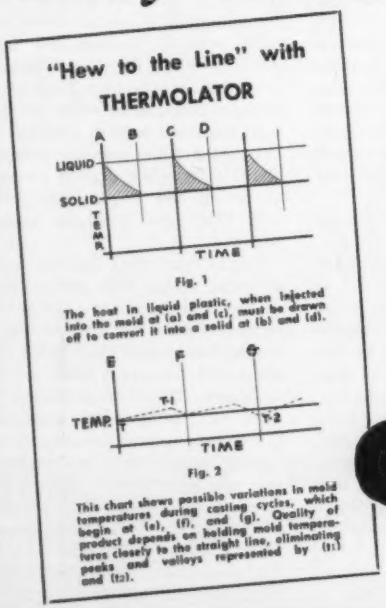
Gun Covers

Vinyl gun covers which were so popular in the last war are not yet in procurement—there are thousands still in storage. Those plasticized with phthalate or phosphate plasticizers are reported in good condition. Vinyl film, either unsupported or laminated to asphalt paper, has been suggested for case liners; another interesting idea is to extrude vinyl over fabric webbing, of which thousands of yards are used by the Armed Forces.

Miscellaneous uses for vinyl now

(*Continued on p. 209*)

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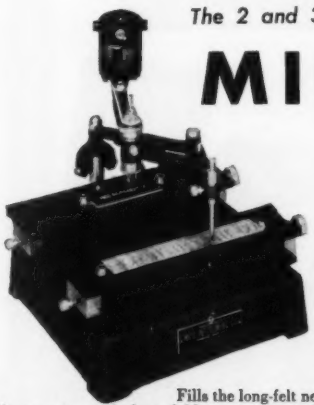


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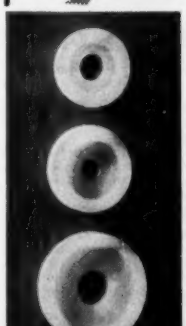
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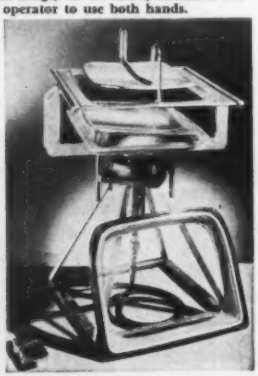
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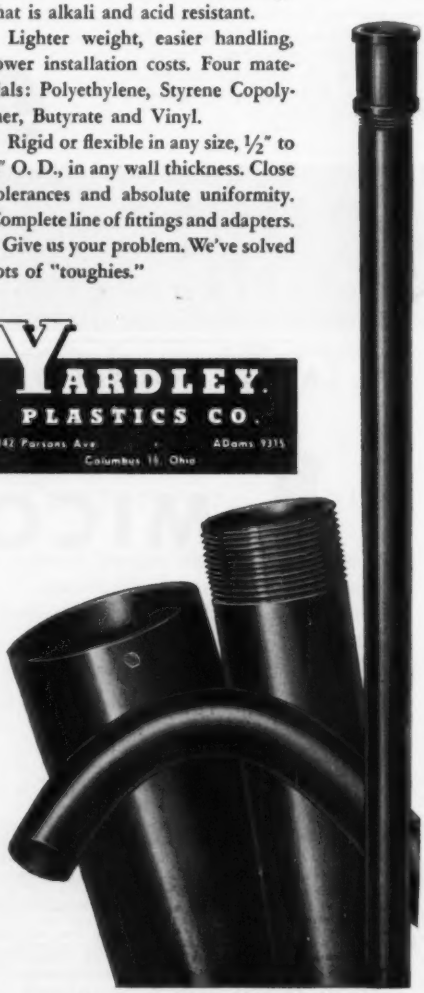
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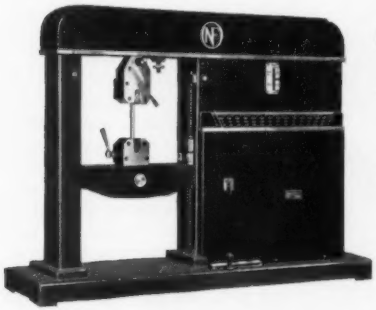
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being considered include molded (either slush or injection) protective covers for metal cartridge clips; rigid vinyl grommets to replace brass and zinc plated steel; automotive parts, particularly in vehicles that must be driven through water; vinyl sponge to replace balsa wood in flotation equipment such as buoys and life rafts. There is even a possibility that vinyl sponge may be used for upholstery in tanks because of its fire retardance.

Production of vinyl-coated wire is now moving along at a fast clip despite the fact that Navy procurement is almost a dribble compared to the peak period of World War II. Airplanes, defense plants, Army barracks, communications, vehicle wiring, radar, jacketing for polyethylene-coated submarine cable used for under-water detection and harbor protection, as well as numerous other jobs will continue to require increasing thousands of pounds of vinyl compound to be used as wire coating.

The Navy needs for wire are considerably less than in World War II, primarily because there is less ship construction. However, a big program for rewiring old ships may soon get under way.

Some changes have been made in the coated wire now used for new ships. In many cases wire conductors used for gun-fire control are now insulated with silicone instead of vinyl. The silicone, with its superb dielectric properties and high heat resistance, permits the use of many more conductors per cable. As many as 37 silicone-insulated wires have been used in the same size cable that once permitted use of only 10 with vinyl insulation.

The jacketing for these fire-control cables may be neoprene, Polyblend, or other vinyl compounds. It runs from 1/8 to 5/64 in. in thickness The smaller diameter of the new cables means that less jacketing material is required, but the vinyl volume is large nevertheless. A big carrier requires some 23 million ft. of conductor wire in 200 miles of cable that weighs over 500 tons.

Power control cable, which is included in the above 500-ton figure, uses tape for insulation. This tape has also recently been changed to silicone varnished glass from the old type oleo-resinous varnished cambric. This cable, too, is sheathed with neoprene or impervious vinyl.

Telephone or communications wire on shipboard remains as it was in the last war—vinyl insulation and vinyl sheathing.

Vinyl paste was once used as gunk to fill the interstices between conductors in cables in order to prevent seepage of water when cables are broken in flooded ship compartments. An asbestos-filled compound is now favored for this particular application.

The foregoing situation in plasticized vinyl points up the well recognized fact that most defense uses for this material are now concentrated in wire and fabric coating. But with a material as versatile as vinyl, it is also probable that scores of applications now in the experimental stage or even undreamed of at the moment will find their way into the military hopper. Furthermore, vinyl may well take an even greater part than ever in the civilian economy during a war-time emergency because it can be successfully used to replace scarce fabric or rubber goods.—END

THE PLASTISCOPE*

NEWS AND INTERPRETATIONS OF THE NEWS

By R. L. Van Boskirk

Plastics Section of NPA

THE Plastics Section of the Chemicals Div., National Production Authority, has now assumed definite form and could be quickly enlarged, with little trouble, in case of an all-out emergency. The present organization has the following departmental set-up.

Chief, Plastics Section—Dr. Lowell Kilgore;

Chief, Thermoplastics Unit—George Sollenberger, formerly of Rohm & Haas Co., assisted by Ed Smith, formerly of Celanese Corp. of America, and T. Allen Davis of the Chemicals Div., U. S. Dept. of Commerce;

Chief consultant, Thermosetting Unit—T. J. Martin of Monsanto Chemical Co.'s St. Louis office, with F. B. Cooling, formerly of the Commerce Dept.'s Chemical Div., now on duty in this unit which will handle polyesters as well as the older type thermosetting materials;

Chief consultant, Adhesives Unit—Edwin Stein of Stein-Hall Chemical Co., with W. E. Bailey, formerly of Stone Straw Co., on permanent duty with the unit.

It is possible that a special polymers unit will be set up to handle administration of the base polymers used for specialty work, especially those used for synthetic fibers.

Robert Kenney, B. F. Goodrich Chemical Co., who, as a consultant, served as an assistant to Dr. Kilgore in setting up this organization, is now on call, devoting only a small portion of his time to this work.

Other officials in NPA who are in charge of materials that interest the plastics industry include L. A. Schlueter, Chief, Aromatic Chemicals Section. Under him is the Intermediates Unit where B. B. Langton, formerly of Monsanto's St. Louis office, is responsible for styrene monomer, synthetic phenol, phthalic anhydride, maleic anhydride, and resorcinol; J. G. Morris, formerly with Union Carbide and Carbon Corp., is in charge of the Plasticizer and Amines Unit; and C. T. Barker, American Cyanamid Co., is handling basic coal chemicals such as benzol, natural tar acids, naphthalene, and so forth.

* Reg. U. S. Pat. Office

Resorcin Plant

AUTHORIZATION to construct a resorcin manufacturing plant in Tacoma, Wash., has been requested from NPA by the Chemical Div., The Borden Co., which estimates 1951 resorcin needs of the adhesives industry at about 1.5 million pounds. The company's own needs for the year are estimated at about half that total.

The new plant will produce at least 1 million lb. of technical grade resorcin annually. Total U. S. production of resorcin, according to the company's application for a necessity certificate, is currently about 3.5 million pounds. The other two companies manufacturing resorcin at present are Koppers Co., Inc., and Heyden Chemical Co.

Castor Oil for Plastics

USE of castor oil in plastics was called sharply to the attention of the plastics industry by the issuance of the Dept. of Agriculture's Defense Order DFO-1 (see MODERN PLASTICS Bulletin, May 1951) when the use of castor oil for plastics was limited to 60% of the amount used in the last quarter of 1950. However, this order permitted a 100%-of-base-period use of castor oil for hydraulics, cable covering, medicinal uses, and food packaging.

This makes the situation a bit confusing insofar as plastics are concerned, because great quantities of vinyl cable covering are plasticized with sebacate and ricinoleate plasticizers which are derivatives of castor oil. Therefore, it looks as though a wire coater can have as much castor derived plasticizer as he used in the last quarter of 1950, but the producer of vinyl upholstery who wants a sebacate plasticizer can only have 60% of the amount used in the base period. But the joker is that there isn't even enough to supply the amount needed for wire coating so there is none available for upholstery.

Castor oil has several principal uses in plastics: as a plasticizer for cellulose nitrate; as a raw material used in the manufacture of sebacic acid which, in turn, is used to produce plasticizers for vinyl; and as a base material in the production of nylon plastic for industrial uses such as brushes, gears, and so forth.

It is believed that the main factor in the castor oil shortage is caused by the exorbitant demand for sebacic acid which, in addition to its use in plastics, is in great demand for explosives and as a lubricant for military aircraft. Manufacturers of sebacic acid are also hindered by the shortage of sulfuric acid which is used as the fat splitting agent on caustic fused castor oil to produce sebacic acid.

The sebacate plasticizers, which are particularly desirable because they help to overcome low temperature brittleness, have been in such great demand for vinyl cable insulation that the producers of sebacate plasticizers have not had enough to fill the demand for DO orders. Consequently, there are no sebacate plasticizers left for other applications.

The type of nylon used for jacketing infantry assault wire and for other industrial uses is also made from sebacic acid. Nylon may be made from adipic acid, sebacic acid, or furfural, but much of the type now used for industrial nylon is that produced from sebacic acid. Since the government had already run into difficulty obtaining sufficient nylon for various defense jobs, the sebacic acid shortage has compounded the problem.

The importance of castor oil as a raw material for industry, and particularly its relationship to the synthetics industry, is seldom realized. Usage has grown from less than 20 million lb. in 1910 to 180 million lb. in 1950. Government jobs alone could consume 200 million lb. in 1951. Thirty-five percent of all castor oil is used in paint, varnish, and lacquers; about 6% in sebacate and ricinoleate plasticizers for vinyl. The Baker Castor Oil Co. alone sells 185 products which it manufac-



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PLASTISCOPE

tures from castor bean. Another 100 are in development, among which are new plasticizers and stabilizers.

In its belief that the castor oil industry is still in infancy, Baker has devoted considerable expenditure of time and money to encourage production of castor bean plants in the United States, both as a profitable venture and for defense security. Castor beans come from Brazil, India, Manchuria, and Africa, but can be profitably grown in many parts of the United States, particularly the Southwest. Baker has been instrumental in the development of a 4-ft. high bush, the beans from which can be easily harvested by a new machine built for the purpose. Foreign bushes are often 30 ft. high, and the crop is harvested by hand. Some 30 million lb. of castor oil will be processed from United States-grown beans in 1951 as a result of Baker research.

If progress continues, it is quite possible that the castor bean will play a much greater part in the synthetic industry, particularly in plastics, where the demand for plasticizers derived from castor oil has barely scratched the surface.

Fellowship at Princeton

ESTABLISHMENT of a Bakelite Fellowship in plastics for graduate work at Princeton University has been announced by Bakelite Co., Div. of Union Carbide and Carbon Corp.

The Plastics Laboratory at Princeton contains equipment for molding and fabricating plastics, evaluation of plastics materials, and for chemical, electrical, and mechanical research.

Casting Compound for Tooling

AUGMENTING its group of casting compounds and plaster hardeners, Furane Plastics, Inc., 719 W. Broadway, Glendale, Calif., has developed a new formulation based on amino-aldehyde resins to be called Calcerite-B. According to company literature, the resin solids and fillers, which possess good physical properties and high temperature stability, are activated by water and set at room temperature, though curing at 120 to 140° F. is required to develop optimum properties. The compound forms clean, hard, working surfaces, and is recommended for use in production tooling, checking fixtures, embossing tools, patterns, duplicating machine dies.

Coloring Pigments

TESTED dispersed organic pigments in powder form are now being offered for use in coloring vinyl film and sheeting by Vansul & Co., Englewood, N.J. Designed for use in pre-blending or dry blending techniques, the powder is free flowing and non-dusting; a ready mix with dry vinyl resin can be made prior to fluxing which is said to result in rapid and complete dispersion after fluxing.

The company also states that an exclusive colloidal process gives not only a uniform color particle size, but develops a maximum of color strength. Samples and technical information are available on request.

Military Uses for Acrylic

CIVILIAN orders for acrylic plastics are still being filled in reasonable volume despite increasingly heavy military demands, according to Dr. D. S. Frederick, vice president of Rohm & Haas Co.

Increased production facilities for acrylics have been added recently, but despite this increase, civilian shipments are being allocated by this company in order that these non-military accounts may be serviced equitably. Further increases in production of acrylic are scheduled, but whether or not these materialize depends on the availability of raw materials.

The most important single field of military application is in transparent enclosures for aircraft. The whole world knows that this demand is expected to increase steadily not only because of stepped-up plane production, but because of the increasing use of laminated acrylic sheets in such applications. Furthermore, large quantities of acrylic will be used to fill DO orders for glazing in defense construction such as factories, prefabricated military buildings, and government structures. Other defense applications include tank periscopes, radar screens, aircraft plotting boards and status boards, lenses and windows for military vehicles, protective shields for machinery, and lighting fixtures for factories and office buildings.

As government restrictions tighten, Dr. Frederick reported, the company expects a decrease in the volume of acrylic sheet required for store fronts and signs, and of molding powder for automotive and television parts. He indicated that the company's development efforts in the fields of signs, store modernization, and general architectural applications will become secondary to providing technical assistance on problems connected with defense applications.

Silicone Adhesive

BONDS between silicone rubber and metals, ceramics, or glass—that are stronger than the rubber itself—are now possible with G-E 81267 primer, a new thin, light-colored liquid developed by General Electric Co.'s Chemical Department. An interesting feature claimed for G-E 81267 primer is its ability to develop a bond strength greater than the strength of the rubber at any stage of the cure.

This adhesive now makes possible a wide variety of silicone rubber-to-metal molded products which include shock and engine mounts that resist both high and low temperatures. Also, improved rubber-glass laminated structures are now possible, and the company's new high-strength silicone rubber in conjunction with G-E 81267 primer can be used as an adhesive with unusual new properties.

Southwest Plastics Plant

PLANS for the construction of a chemical plant located at Pampa, Tex., have been announced by Celanese Corp. of America. The plant, which will produce materials used in the manufacture of yarns and plastics, synthetic rubber, explosives, and other products, is expected to broaden the supply of chemicals for an accelerated defense program.

The firm has also announced that the new dissolving pulp plant of Columbia Cellulose Co. Ltd., its Canadian affiliate, began operations recently with an indicated annual ca-

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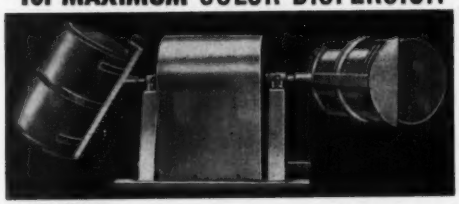
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Harvard Fellowship

AN ANNUAL research professorship in chemistry has been established at Harvard University by E. I. du Pont de Nemours & Co., Inc., in honor of the inventor of nylon, Dr. Wallace Hume Carothers. The company is making an annual gift of $15,000 for five years to support the professor holding the appointment each year and his research.

Low-Cost Plasticizer

ORTHO-NITROBIPHENYL, a low-cost primary plasticizer compatible with a large number of materials, is now available in quantity from Monsanto Chemical Co. The company points out that ONB is a possible replacement for many plasticizers which are in short supply due to raw materials scarcities. Most resins, both synthetic and natural, can be plasticized with it. The product is particularly recommended for use with polyvinyl acetate adhesives, as a low-cost primary plasticizer for polyvinyl chloride, and for cellulose acetate and nitrate.

Fluorocarbon Tubing

TUBING with a diameter as large as 2 in. is now being produced by Plax Corp., Hartford, Conn., of Kel-F, a high-temperature resistant polymer of trifluorochloroethylene. Rods and sheets in greater thicknesses are also being manufactured.

S.P.I. Elections

AT THE recent meeting of the Policy Committee of the Reinforced Plastics Div. of S.P.I. in Atlantic City, N.J., the appointment of the following sectional chairmen was announced by the chairman of the division, Leonard S. Meyer, manager, Plastics Div., Western Products, Inc., Newark, Ohio: West Coast, W. Brandt Goldsworthy, Industrial Plastics Corp., Gardena, Calif.; Midwest, Roger B. White, president. Laminated Plastics, Inc., Cleveland, Ohio; East, Harold Freeman, American Cyanamid Co., New York, N.Y.

The following committee chairmen were also appointed: Program, Dr. R. W. Ehlers, U. S. Quartermaster Corps; Publicity, Sherman Stambaugh, Owens-Corning Fiberglas Corp., Toledo, Ohio; Exhibit, Samuel S. Oleesky, U. S. Naval Air Development Center, Johnsville, Pa.; and Preparedness, J. S. Finger, president, Corrulux Corp., Houston, Texas.

Anti-Foaming Compounds

EXCELLENT results in defoaming a wide range of compounds have been reported by Polymer Industries, Inc., Astoria, L.I., N.Y., using General Electric silicone anti-foam agents. Concentrations as low as 75-100 parts per million are said to defoam efficiently. G-E silicone anti-foam is a white, odorless liquid that may be dissolved in petroleum naphtha, tuluol, xylol, or chlorinated aliphatics for addition to foaming manufacturing systems.

Longer Life for Dies

LIQUID blasting by a new process to remove heat-treating scale and discoloration from forging dies has been developed by Pangborn Corp., Hagerstown, Md. In this Hydrofinish process, the surface is blasted with a high velocity stream of non-metallic abrasive particles suspended in an aqueous solution. The process is said to result in a smoother finish on the dies, give better forgings, permit closer tolerances, and reduce the tendency of the die to stick during forging.

The versatility of liquid impact blasting has led to its use also for the removal of grinding lines and for improving the life of dies for glass, rubber, and plastics.

Research Fellowships

TWO new research fellowships have been established at the Mellon Institute of Industrial Research, University of Pittsburgh, Pittsburgh, Pa. Charles E. Colwell has received one fellowship donated by The Quaker Oats Co., Chicago, Ill., that relates broadly to research on the utilization of by-products from the manufacture of furfural.

Pittsburgh Plate Glass Co. has established another fellowship at the institution which will deal with synthetic fibers suitable for use in paint and other brushes. Dr. Adelbert W. Harvey has been appointed Senior Fellow.

Styrene Finishing Lacquer

APPLICATION of a new lacquer, Base C 5123, to styrene products imparts a smooth, uniform finish coating without crazing or wrinkling. The manufacturer, United Lacquer Mfg. Corp., 1001 W. Elizabeth Ave., Linden, N.J., claims this lacquer provides a smooth coating without attacking the styrene and causing minute cracks.

Base C 5123 can be applied with standard spray equipment and gives good adhesion and a high degree of durability. It is particularly useful in finishing toys, novelties, lamps, and office and desk supplies.

Coumarone Indene Replacements

TO RELIEVE the shortage of coumarone indene resins, Harwick Standard Chemical Co., 901 Broad St. Bank Building, Trenton, N.J., has announced the availability of two new products.

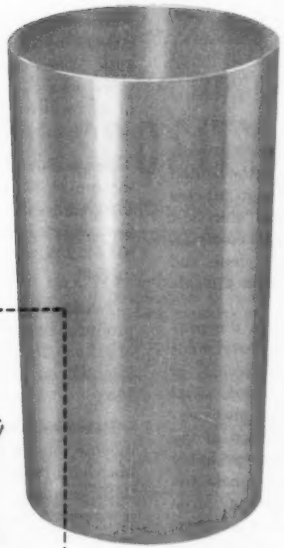
Piccocizer R is a light colored, high boiling point, polymerized aromatic resin in liquid form. Its suggested use is as a replacement or extender for the light colored, high melt point coumarone indene resins.

Aromatic Plasticizer #25 is a low melting point (approximately 25° C. ball & ring) polymerized aromatic resin to be used as a replacement or extender for other less available reinforcing plasticizing resins.

Styrofoam in Shrimp Trawlers

LATEST use for Styrofoam, produced by The Dow Chemical Co., is in the shrimp industry. The plastic foam, which has proved successful as a low temperature insulation medium in cold storage warehouses, refrigerated box cars, etc., is now being installed in the shrimp trawlers of Captain Carl Muchowich & Sons, Freeport, Texas.

This company has added a new shrimper to its fleet which utilizes Styrofoam for insulation throughout the storage areas. The material possesses properties that are essential





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Plant Expansion

MAJOR expansion of its Repauno plant at Gibbstown, N.J., for increased production of nitric acid and dimethyl terephthalate (DMT) has been announced by E. I. du Pont de Nemours & Co., Inc. DMT, a white flaky powder produced from nitric acid and xylene and methanol, is a principal raw material for the manufacture of the company's synthetic textile fiber first known as Fiber V, then as Amilar, and now as Dacron.

New Chemical Division

FORMATION of a chemical division to manufacture and sell chemicals, synthetic rubbers, and related products has been announced by The General Tire & Rubber Co. as another major step in its expansion program. M. G. O'Neil will head the new division, primary function of which is to carry through to large-scale commercial operations the developments of the company's chemical research division. Edward V. Osberg has been named assistant manager, while G. S. Schaffel will supervise manufacturing activities.

More Acetylene

ACETYLENE is one of the most widely used raw materials in the plastics industry, and is particularly valuable in the production of vinyl. Not long ago a National Security Resources Board official stated that in case of an emergency, acetylene might well become one of the three or four scarcest materials.

It is, therefore, encouraging to note that Carbide and Carbon Chemicals Co. is expanding its new acetylene plant in Texas City, Texas. At that plant the firm uses a radically different chemical process for the production of acetylene, employing a partial oxidation process involving the high temperature reaction of methane and oxygen.

This is the first commercial installation of the partial oxidation process for acetylene production in the United States. The partial oxidation process requires appreciably less electrical power than any known electrical process for producing acetylene, and about the same power as for the calcium carbide process.

In addition to its use in the production of vinyl chloride, acetylene is also used in the manufacture of acrylonitrile and acetic acid, vinyl acetate, trichloroethylene, and neoprene. Commercial operation of the partial oxidation process probably will be confined to large-scale installations in areas having large natural gas reserves and to locations where the acetylene gas produced can be used adjacent to the point of manufacture. Carbide and Carbon's acetylene produced in the Texas plant will be used entirely within that plant where resin intermediates, vinyl chloride, and vinyl acetate will also be made.

At the Niagara Falls plant of Carbide and Carbon, acetylene will continue to be manufactured from calcium carbide. It has been proved that the new process of manufacture is not, and undoubtedly never will be, economical in that location.

Ion Exchange Synthesizer

TRIAL-LOT quantities of 3,3'-Iminobispropylamine are now available from the New Product Development Dept. of American Cyanamid Co. The compound, a colorless, high-boiling, strongly basic amine, has been found useful in the synthesis of ion exchange resins. It is completely miscible at room temperature with water and most common organic solvents.

FINANCIAL

Dewey & Almy Chemical Co. reports a net profit of $414,746 on net sales of $7,125,801 for the March 1951 quarter, compared with net earnings of $214,071 on sales of $3,908,382 for same quarter last year.

Heyden Chemical Corp. reports consolidated net sales in 1950 of $26,631,348, the largest in its history, compared with $26,200,000 for the previous year. Net profits were $2,293,597 for 1950 against $1,494,655 in 1949. The company appropriated more than $1 million for expansion of its facilities for producing Pentek and pentaerythritol derivatives.

Ferro Enamel Corp., reports net income of $2,211,147 after taxes for 1950, compared to $972,983 for 1949. Consolidated sales for 1950 totaled $33,445,186, compared to $24,660,998 in 1949.

Textileather Corp. reports a net profit for 1950 of $655,666 on net sales of $17,035,274 compared with profit of $500,302 on sales of $13,469,753 in 1949.

Hercules Powder Co. reports a net income for the three months ending March 31, 1951 of $3,993,538 compared with earnings of $2,794,657 during a comparative period in 1950. Net sales on operating revenue for the 1951 quarter were $54,463,218 compared with $32,995,072 in the same period of last year.

Catalin Corp. of America reports a net income of $120,015 for the March quarter compared with $52,759 last year. Net sales were $3,359,563 as against $2,061,318 in 1950.

American Cyanamid Co. and subsidiaries report a March quarter net income in 1951 of $9,090,091 compared with $6,629,744 a year ago. Net sales increased to $102,193,058 from $72,724,620.

Union Carbide and Carbon Corp. made $29,178,685 in the first three months of 1951 compared with $27,407,345 for the March quarter of 1951. Gross sales amounted to $224,787,433 compared with $159,696,335 in the initial quarter of last year. The company's tax bill for this period rose to $41,388,365 from $17,415,118 in the 1950 period.

COMPANY NOTES

Reinforced Plastics Corp. has recently been formed by **Molded Resin Fiber Co.**, Ashtabula, Ohio, to manufacture larger glass fiber flat sheets and shapes. **J. R. Newlon,** now assistant manager of Molded Resin, is manager of the new plant, the premises of which adjoin those of the parent company. Molded Resin will handle all sales for the newly formed firm.

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The Atlas Mineral Products Co. announces that **Howard Holt** has joined the **Technical Service Dept., George Gabriel** has been promoted to engineering coordinator, and **Gerald F. Gilbert, Jr.,** advances to product director in charge of chemical-resistant cements.

American Cyanamid Co. has entered into a contract to lease 1055 Commonwealth Ave., a 60,000-sq. ft. building, in which it will consolidate its Boston, Mass., facilities. The firm will also start construction soon on a 64,000-sq. ft. building in Los Angeles which will consolidate its several divisions on the West Coast.

Glass Fibers Inc., has moved its offices to 1810 Madison Ave., Toledo 2, Ohio.

Mid-America Plastics, Inc., announces the addition of manufacturing facilities for dry colorants used in coloring of crystal styrene and other thermoplastics. The company has purchased the rights and formulas of Dry Color Div., **The Jamison Plastic Corp.,** Freeport, N.Y., and the dry coloring operation will be under the jurisdiction of the **Color Div., Mid-America Plastics, Inc.,** 2443 Prospect Ave., Cleveland, Ohio. The dry coloring, known as Colorblende, is available in 17 colors. **Ernest P. Moslo** is president of Mid-America Plastics, Inc.

Industrial Plastics Co. has moved its factory and office to larger quarters at 1829 S. 55th Ave., Chicago 50, Ill.

Plastic Manufacturers, Inc., Stanford, Conn., announces the election of **Warren E. Gill** and **Karl J. Walter** as vice presidents. Mr. Gill, formerly with Container Corp. of America, will be in charge of operations; Mr. Walter, formerly general sales manager, will continue to supervise sales activities.

The B. F. Goodrich Co. announces that construction on additional facilities for the Research Center has been started at Brecksville, Ohio. The new construction, which will be ready for occupancy in October 1951, includes additions to existing buildings which were opened in 1948.

The Polymer Corp., Reading, Pa., has turned over the sale of all its products to a separate company, **The Polymer Corp. of Pennsylvania.** The Polymer Corp. itself will restrict its activities to production, research, and development. No change of management is involved.

Columbia Protektosite Co., Inc., Carlstadt, N. J., has been purchased by **Curtiss Wright Corp.,** Wood-Ridge, N. J., which plans to continue the plastics manufacturing operations of Protektosite.

Eagle Industries, 110 Washington St., New York, N. Y., is liquidating the equipment of two rubber and plastics plants which were located in the Detroit and New York areas. The equipment includes hydraulic presses and calenders.

General Electric Co. announces that **Anthony F. Forni** has been appointed Mycalex sales development supervisor for the **Plastics Div., Chemical Department. Thomas H. Way** has been named to the **Mfg. Div.** staff of the same department. **G. S. Berge** succeeds him as manager of the Taunton, Mass., plant.

Monsanto Chemical Co. has created two new sections in the development department of the **Organic Chemicals Division. J. Kenneth Craver** has been named manager of the resin materials and functional fluids section, and **Roland S. Shumard** has been appointed manager of the fine chemicals section. **Allan Low** has been named division engineer of the **Plastics Div.,** succeeding **C. O. Hoyer,** who has accepted a position of chief engineer of **The Chemstrand Corp. C. D. Smith** and **F. E. Reese** have been promoted to assistant division engineers, and **A. W. Andrews** to chief project engineer for the company.

Koppers Co., Inc., has appointed **T. C. Keeling, Jr.,** and **George W. Naylor** assistant vice presidents in the **Chemical Division.** Mr. Keeling is sales manager of the division and Mr. Naylor is manager of the sales development section as well as in charge of the company's Washington, D.C., office. **Cooke Bausman, Jr.,** has been named manager of the sales department, **Central Staff,** with **Donald MacArthur** his assistant.

Goodyear Tire & Rubber Co. has appointed **Clinton O. McNeer** as **Chemical Div.** sales manager. **J. A. Weatherford** replaces him as district sales manager in Chicago. **John F. Chartier** has been transferred from the Akron staff of the **Vinyl Film** offices of the **Films and Flooring Division.**

Detroit Mold Engineering Co. has made its line available to molders on the West Coast through a new office at 3700 S. Main St., Los Angeles, Calif.

Synthane Corp., manufacturer and fabricator of laminated plastics, has moved its Kansas City, Mo., office to 311 Merchandise Mart Building, 2201 Grand Ave.

The Society of the Plastics Industry has moved its New York headquarters to larger offices at 67 W. 44th St.

Canadian Chemical Co. Ltd. has named **Vincent Anwyll** plant manager of the Edmonton, Alberta, operation, and **J. Gordon Mitchell** plant engineer.

Plastics Div., Fabricon Products, Inc., 1721 W. Pleasant Ave., River Rouge, Mich., has completed an expansion program which, in addition to a new melamine treating unit at River Rouge, includes a new plant in Los Angeles covering 150,000 square feet.

Jefferson Chemical Co., Inc., 711 Fifth Ave., New York, N.Y., announces the election of **W. H. Bowman, M. Neuhaus,** and **L. P. Scoville** as vice presidents.

Burrell Corp., manufacturer of scientific apparatus and laboratory chemicals, has moved its offices and laboratories to new quarters at 2223 Fifth Ave., Pittsburgh 19, Pa.

Nylon Molded Products Corp. has opened a new plant in Garrettsville, Ohio, for the specialized custom molding of nylon and polyethylene products.

The Carborundum Co. has established a Marketing Dept. under the

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HEADQUARTERS FOR SCALES

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direction of **Frederick T. Keeler.** Designed to strengthen and coordinate the functions of marketing, the new department brings together all related staff functions of marketing and will service all domestic and Canadian marketing operations of the company. **Arthur Batts, Jr.,** has been named manager, and **Arthur W. Cowles** advertising manager.

Millmaster Chemical Corp., 420 Lexington Ave., New York, N. Y., is sales representative for the marketing of benzene and toluene sulfonic acids and allied chemicals manufactured by **Sloss-Sheffield Steel & Iron Co.,** Birmingham, Ala.

Worthington Pump & Machinery Corp., Harrison, N. J., has named **F. C. Winter** manager of defense procurement and **C. W. Camp** his assistant. **John Mikulak** has been appointed assistant to **L. C. Ricketts,** vice president in charge of manufacturing for the firm.

Sylvania Electric Products, Inc., has made two new appointments in its **Radio and Television Tube Divisions: D. W. Gunn** has been named equipment sales manager and **G. V. Bureau** is government sales manager.

Cutler-Hammer, Inc., has opened a new sales office at 120 E. Third St., Charlotte, N. C.

PERSONAL

E. E. Hardesty, formerly of Dumont Corp., has joined **Narmco, Inc.,** as manager of the San Diego factory. The company manufactures Fiberglas laminates and metal-to-metal adhesives.

R. J. Neubecker, formerly with Pantasote Co., has joined **American Molding Powder & Chemical Corp.** as head of its **Defense Division.**

Dr. Victor E. Wellman has been named director of **Process Engineering Dept., American Cyanamid Co., Calco Chemical Division.** He joined the company in 1945.

Newton L. Nourse has been appointed to the newly created post of general sales manager of **Brown Co.,** 500 Fifth Ave., New York, N. Y., producer of wood cellulose. **John J McDonald** succeeds him as manager of the pulp sales division.

K. O. William Sandberg has been named manager of the industrial engineering section of **General Electric Co.'s Chemical Department.**

Andrew Kalitinsky has been appointed manager of the **Special Projects Dept., The M. W. Kellogg Co.,** refinery and chemical engineer of New York, N.Y.

David L. Matthews has been appointed plant manager of the Avon Lake, Ohio, general chemicals plant of **B. F. Goodrich Chemical Co.** He joined the firm in 1940.

Emory W. Worthington has been named vice president in charge of mechanical development for **Bjorksten Research Laboratories, Inc.,** with headquarters in Madison, Wis.

Dr. M. F. Browne has joined the **Research Dept. of Plaskon Div., Libbey-Owens-Ford Glass Co.**

Russell C. Weigel, manager of an industrial sales section in the **Polychemicals Dept., E. I. du Pont de Nemours & Co., Inc.,** has been promoted to assistant manager in the department's planning division.

Gordon Kiddoo has been appointed assistant director of the **Petrochemical Research Dept., National Research Corp.** He was formerly with Continental Carbon Co.

A. T. Look has joined the plastics division of **The Dow Chemical Co.** as coordinator of raw materials and plastics production. **Grant Cheney** succeeds him as head of the extrusion molding section.

Rodney C. Gott has been named a vice president of **American Machine & Foundry Co.,** 511 Fifth Ave., New York, N.Y. Formerly assistant to the president, Mr. Gott will now supervise three of the company's major subsidiaries.

Arthur Slobin has been appointed purchasing agent and production control manager for **The Jamison Plastic Corp.,** Freeport, N.Y.

Bernard Wilks has been named to the sales staff of **Pantasote Co.,** New York, N.Y. He was formerly associated with Cohn-Hall-Marx.

Samuel P. Zuccarelli has severed his connections with Nixon Nitration Works, where he was manager of research and development.

Royden C. Rinker, formerly of Koppers Co., Inc., and more recently of the Plastics Section, U.S. Army Ordnance Dept., has joined **The Carborundum Co.** in Niagara Falls, N.Y., where he will be in charge of research in coated abrasives.

Leo J. Sobell has been named representative in the New York Metropolitan area for **American Cyanamid Co., Calco Chemical Div., Pigment Department.**

James P. Gibbons has joined the Industrial Products Div., **Hess, Goldsmith & Co., Inc.,** 1400 Broadway, New York 18, N.Y., as sales representative handling non-woven laminated products. He was formerly associated with General Electric Co.

William S. Richardson, president of **B. F. Goodrich Chemical Co.,** has been elected a vice president of **The B. F. Goodrich Co.** He will continue as president of the chemical company. Mr. Richardson has been with the firm since 1926, and was elected president of the chemical company when it was formed in 1945.

David Guarnaccia has been appointed assistant manager of thermoplastic molding material for the **Plastics Div., Monsanto Chemical Co.**

E. D. Randall has been named purchasing agent for **Pantasote Co.**

MEETINGS

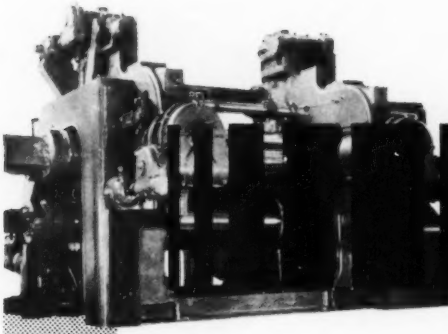
May 28-June 8—Canadian International Trade Fair, Exhibition Grounds, Toronto, Canada.

June 18-20—Pacific Coast Chapter Meeting, The Society of the Plastics Industry, Tahoe Tavern, Lake Tahoe, Calif.

June 18-22—American Society for Testing Materials, Annual Meeting, Atlantic City, N.J.

S. P. E. Meetings

June 20—New York Section, S.P.E., Gotham Hotel, New York, N.Y. Frank Helander, The Watson-Stillman Co., will discuss large injection machines.



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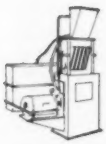
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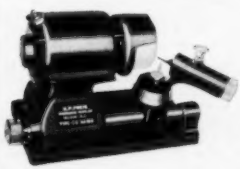


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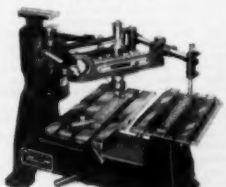
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FOR SALE: 8 Pellet Presses: Kux model 25 (21 punch & 25 punch); Stokes D-3 and D-4. Read Co. 250 gal. heavy duty double arm sigma blade jacketed mixers. PERRY EQUIPMENT CORP., 1529 W. Thompson St., Phila., 21, Pa.

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Colton 3 RP and 2 Rotary Tablet Machines.
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805 Housatonic Ave. 4-9471 Bridgeport, Conn

FOR SALE: L-2½ 8-ounce Lester Injection Molding Machine, Serial No. 388 May 1946. 30 HP GE Motor, 4-Wheelco Controls, starter, relays, 4" adapter plate, spare parts. Like new, now in operation and open for inspection. $12,000.00 ROYLETT MFG. CO., Box 4083, Memphis, Tenn.

MACHINERY and EQUIPMENT WANTED

MOLD WANTED for injection molding. We will buy one mold or a complete line or series of molds for finished resalable items. Housewares, toys, novelties, etc. Will also buy molds for industrial parts such as handles, knobs, drawer pulls, gears. All items for resale in U. S. A. Send detailed information to Victory Manufacturing Company, 1722 W. Arcade Place, Chicago 12, Illinois.

WANTED: Defiance #20 Preform Press, used. Plastic Molding Corporation, Sandy Hook, Connecticut.

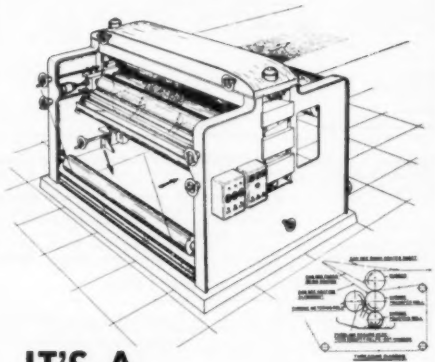
WANTED: Two used 16 oz. Watson-Stillman injection molding machines. State price, condition, and date purchased. Reply Box 960, Modern Plastics.

WANTED: Ball and Jewel Grinder No. 1½ for cutting vinyl. Complete Machine—Rotary cutters with hopper, base and fly wheel, flexible coupling, magnetic starter, 15 H.P. motor. Reply Wood's Plastics, Inc., 410 Frelinghuysen Avenue, Newark 5, N. J.

WANTED: By Molder—Injection molding machines. Two to 16 oz., late models in good condition. State all details including price and whereabouts. Reply Box 975, Modern Plastics.

(Continued on page 226)

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Photos courtesy Ross Operating Valve Co Detroit, Mich.

A saving of 12 man-hours per shift is reported by Ross Operating Valve Company with this fixture, built around 24 "De-Sta-Co" Model #620 Toggle Clamps.

The fixture holds Ross 4-Way air operating valves during a "run-in" operation. The clamp plungers are tipped with rubber grommets which seal exhaust and intake ports during the "run-in," after which the valves are torn down and inspected carefully. Besides the actual saving in man-hours, these "De-Sta-Co" Toggle Clamps convert a tedious setup job into one quickly and accurately performed by less highly-skilled labor.

Plastics fabricators can use setups similar to this fixture for cementing, bonding, or machining of plastics parts. Features making "De-Sta-Co" Toggle Clamps "the answer" for tooling up these operations include

- Rapid toggle action for speedy positioning of work
- Precision construction that assures perfect work alignment
- Low first cost, making possible efficient, inexpensive fixtures
- Wide range of models . . . a type for every application

For *your* problem in production work-holding there's a "De-Sta-Co" Toggle Clamp that assures increased efficiency, accuracy and savings. Whether you're machining, gluing, bonding, inspecting or assembling plastics parts, you do it faster . . . and cheaper . . . with "De-Sta-Co" Toggle Clamps.

Our catalog describes more than 40 fixtures and portable models, holding capacities over 2500 lbs. "De-Sta-Co" template sheets, full and half-scale, speed design of tools and fixtures . . . trace right onto your layout! There's a free set for you, if you're responsible for tool design. Write for your catalog, template kit, and name of nearest "De-Sta-Co" distributor.

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CLASSIFIED ADVERTISING

(Continued from page 224)

MATERIALS FOR SALE

LUMARITH SHEETING for sale. We have available 400 sheets of Lumarith Opaque White F16340, 21 x 50, 10 gauge. Perfect stock in original cartons. ASA BARTLETT PRESS, 25 Foster Street, Worcester 8, Mass.

FOR SALE—3600 Lbs. BM-10136, Flow S, in original drums. Will furnish sample. Reply Box 965, Modern Plastics.

FOR SALE: Cellulose Nitrate scrap. Crafco, 25 Bartlett St., Everett 49, Mass.

AVAILABLE for immediate shipment 800 Sheets CELLULOSE ACETATE .060" x 28" x 50", Red Translucent, Monsanto, 30% below list, $1.15 per lb. also 6000 lbs. Clear Lucite Sheet Cut Offs, .030", .100", 1/8", 3/16", 1/4", 5/16", and 3000 Sheets Cellulose Nitrate 28" x 50" x .010", .012", .020" Clear and Colors, Paul Blum Company, 316 Larkin Street, Buffalo, New York.

MATERIAL WANTED

WANTED: PLASTIC Scrap or Rejects in any form. Acetate Butyrate, Polystyrene, Acrylic, Vinyl Polyethylene, etc. Also wanted surplus lots of phenolic and urea molding materials. Custom grinding, magnetizing and compounding. Reply Box 951, Modern Plastics.

WANTED: PLASTIC SCRAP or REJECTS in any form: Cellulose Acetate, Butyrate, Polyethylene, Polystyrene, Vinyl, Acrylic and Ethyl Cellulose. Reply Box 952, Modern Plastics.

WANTED: Ethocel, Butyrate, and Polystyrene material—virgin, regrind, and scrap parts. Reply Box 953, Modern Plastics.

WANTED: ACRYLIC SCRAP, Lucite or Plexiglas. Injection, compression or sheet; clear or colored; painted or metallized; ground or unground. Can use any quantities available. Reply Box 961 Modern Plastics.

WANTED: Plastic Scrap & Rejects in any form, such as Cellulose Acetate, Butyrate, Polystyrene. Soft & Rigid Vinyls, Polyethylene, Lucite & Plexiglas scrap and offcuts. Claude P. Bamberger, Inc., 228 Wooster St., New York 12, N.Y. Tel.: SPring 7-0933.

WANTED: Your Scrap Vinyl, Polyethylene, Polystyrene, Acetate, Ethyl Cellulose, and etc. OFFERING: Reprocessed Pellets, Custom Grinding. Reply Industrial Plastic & Textile Company, 72 Woolsey Street, Irvington, N. J.

HELP WANTED

"COATER FOREMAN OR ENGINEER—To take charge of new coating unit being established in Pennsylvania. Must be experienced with organosols and plastisols. Submit detailed resume of background and experience with first letter. Reply Box 954, Modern Plastics."

PLASTIC MOLDING ENGINEER

Real opportunity for graduate with several years of experience in large volume manufacturing of molded products, capable of analyzing for new production and conducting developments of processes and facilities. Include photo with reply stating complete qualifications and salary expected. Address reply to:

Employment Supervisor
Western Electric Company, Inc.
2525 Shadeland Avenue
Indianapolis, Indiana

WANTED: Chemist with experience in vinyl compounding for plastic extrusion plant. Excellent opportunity. Good Salary. Reply Box 956, Modern Plastics.

WANTED: Plant Manager. Complete knowledge of injection and compression molding. Ability to quote piece part prices. Plant located in Middle West. State full particulars and salary requirements. Reply Box 966, Modern Plastics.

WANTED: Vinyl Chemist, Experienced in Compounding Vinyl Resins For Calendering. Established-Progressive N. Y. Mfg. Co. Send Resume Stating Background and Salary to Box 967, Modern Plastics.

Representatives wanted for Pacific Coast, Southwest, and Middle West. Prefer established concern or sales agency already servicing plastic molders and mold makers.

To handle sales of pressure-cast Beryllium copper cavities and Stainless Steel Centrifugal Cast Cavities.

Commission Basis. State qualifications in detail. Reply Standard Tool Company, Leominster, Mass.

WANTED: Regional representatives, with following in industrial field, to represent one of the largest and oldest injection molders in the country. Machine capacities from 3 oz. to 300 oz. Commission basis. Reply Box 970, Modern Plastic.

PLASTICS ENGINEER WANTED: Established precision custom molder needs an engineer experienced in production control, inventory, estimating parts and mold design for injection, jet, compression and transfer molding. Salary. Reply giving details of education, past earnings, experience and salary requirements. This information will be held confidential. Reply Box 974, Modern Plastics.

GENERAL MANAGER, fully experienced, to take complete charge of modern, progressive, injection molding plant located in Texas. Must have knowledge of mold design, parts estimates, production scheduling, and capable of handling men. Good opportunity for right man. Reply giving age, detailed experience, education, and salary requirements. All replies held confidential. Our employees are aware of this ad. Reply Box 976, Modern Plastics.

WELL ESTABLISHED injection molding firm, in southern New England, manufacturing proprietary goods, requires the services of a general manager with experience in production and assembly operations. Excellent opportunity for the right man. State full particulars. Reply Box 959, Modern Plastics.

ENGINEER MOLDING: Prominent Phila. company performing proprietary molding is in need of Senior Engineer who has experience molding thermosetting materials. Must be familiar with problems inherent in high speed compression molding. Must be well acquainted with techniques of molding inserts. State education and experience, also give salary requirements to: C-51 P.O. Box 3552, Phila. 22, Pa.

MISCELLANEOUS

INVENTIONS WANTED: First-class manufacturer wants inventions using plastics and steel. We can build the molds and dies, run the production, and sell your product. Also interested in buying established businesses. Will pay royalty on existing manufacturing items that we can manufacture and sell. Write Albert E. Payne, Owner-Manager, The Payne Tool and Engr. Co., Springfield, Ohio. Strictly Confidential.

WILL BUY small injection moulding plant complete, or late model 2 oz., 4 oz., and 8 oz. presses in good condition. Reply Box 957, Modern Plastics.

Plastics laminating facility for sale or lease. Suitable for high pressure decorative or industrial grades. Saturator and 38" x 42" eleven-opening press. Write P. O. Box #126, Springfield, Ohio.

FOR SALE OR LEASE: Plastic plant, going business. Large backlog of profitable orders with old, established customers. Fourteen compression presses up to 850 ton, some equipped for plunger molding. One injection machine. Lots of extras—preheater, preformer, tumblers, etc. Located 150 miles from Chicago. Reply Box 964, Modern Plastics.

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FOR SALE: RUBBER-PLASTIC PLANT Complete with Mills—Extruders—Grinders, Etc. With or without Real Estate and Operating Business. Reply Box 968, Modern Plastics.

FOR SALE: NEW PLASTIC PRODUCT having unlimited possibilities in the building and decorative field . . . a translucent paneling made up of polystyrene moldings and simple plastic coated wood framework. Patent Pending. Plastic Injection Mold, Valuable Technical Data and Manufacturing Know How, on outright or royalty basis. Reply Box 969, Modern Plastics.

MOLD WANTED: Toilet seat, must be in good condition; to be used in Europe. Send details, price, etc. to LUIS ROCHA & CO. INC. 152 West 42nd Street, New York 18, N.Y.

MOLDER WANTED: who can supply material for long run production jobs. Molds available immediately for polystyrene work. Standard plastic colors and formulas required. Reply Box 977, Modern Plastics.

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For further information address Classified Advertising Department, Modern Plastics, 575 Madison Avenue, N. Y. 22, N. Y.

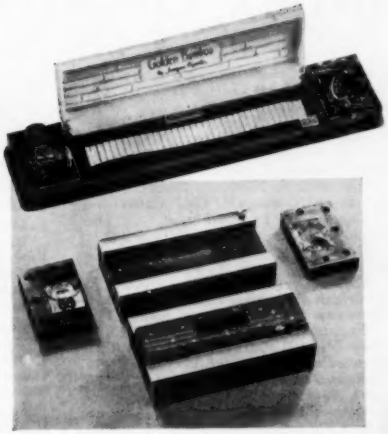
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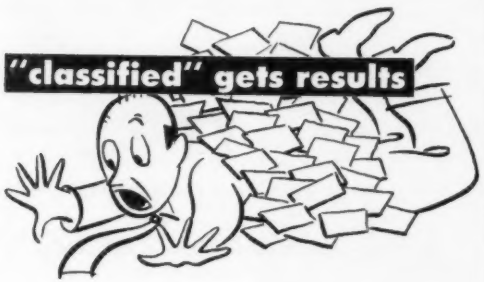
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for Laminates



NIBRO-CEL, a scientifically processed saturating paper, is unexcelled for uniform absorbency and resin pick-up —because of Brown Company's complete control of manufacture from raw material to finished product.

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- **Excellent Punching and Milling Qualities**

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Could you use the services of a qualified custom injection moulder to help you with your defense work? The record of our injection moulding accomplishments in the past speaks loudly and proudly of the Worcester Moulded Plastics Company. Our work in World War II won government plaudits in the form of 5 Army and Navy E awards. The co-operation we extend to leading manufacturers in the plastic revamping of old products or the moulding of new ones adds a note of close harmony to our record. And in addition, our knowledge of government requirements guarantees you an important ally, plastically speaking.

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Custom Injection Moulding

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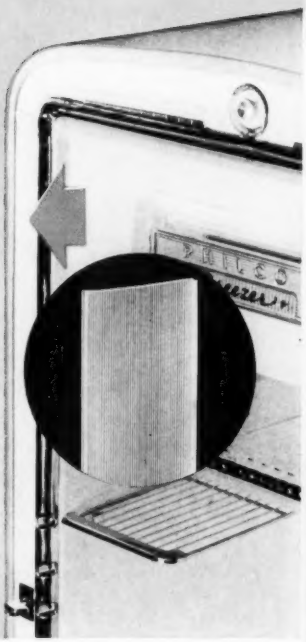
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500,000 SLAMS!

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Conclusion: Versatile VINYLITE Plastics are in domestic refrigerators to stay, for gaskets, breaker strips, shelf supports, seals, grommets, bumpers, other parts.

We think we can show how they can upgrade your products, too—particularly if they require materials with a specific degree of flexibility or rigidity, plus ease of fabrication, plus a rainbow range of colors, at a reasonable cost.

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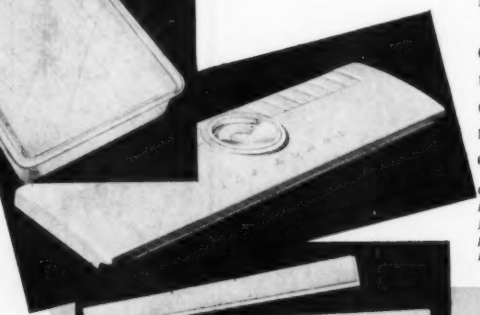
One of a series of messages to design engineers showing how General Electric's *specialized* plastics molding service offers important advantages to selected industries and in defense applications.

Specialized MOLDING SERVICE

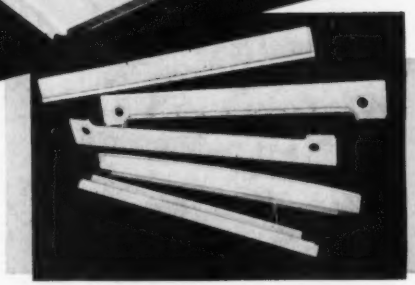
PRODUCES WELL-ENGINEERED, ATTRACTIVE REFRIGERATOR PARTS!







General Electric molds parts like these for several large refrigerator manufacturers.



And remember— G-E sealing caps and sleeves provide low-cost protection for small refrigerator parts.



Here's an example showing why designers specify General Electric's plastics molding service for improved, mass-produced, low-cost products. G-E molded snack boxes, freezer doors, meat trays, and other refrigerator accessories are strong and durable, easy to clean, appealing to the eye.

New G-E injection machines capable of molding parts up to 208 ounces per shot offer new design possibilities. And in many cases, General Electric plastics engineering makes possible important savings on molded parts of this sort.

Depend on G.E.

G-E molding plants are *modern;* they employ the newest machines and techniques. Large users of plastics parts consider G.E.'s large-capacity molding facilities as an efficient adjunct to their own assembly lines.

General Electric's specialized molding service is geared to industries like these: television, radio, washing machine, refrigerator, air conditioning, automotive and electrical apparatus. For information, write to Section B-4, Chemical Department, General Electric Company, Pittsfield, Mass.

MOLDED PLASTICS FOR DEFENSE

Defense contractors can depend on General Electric for developing and producing a great variety of molded plastics parts. The broad scope of this service is indicated by G-E compression equipment ranging in capacities from 3 to 36 inches; injection equipment that can handle shots of from 1½ to 208 ounces.

You can put your confidence in

GENERAL ELECTRIC